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final environmental impact statement

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U.S. DEPARTMENT OF THE INTERIOR

BUREAU OF LAND MANAGEMENT

CRUDE OIL TRANSPORTATION SYSTEM: VALDEZ, ALASKA TO MIDLAND, TEXAS

(AS PROPOSED BY SOHIO TRANSPORTATION COMPANY)

EXECUTIVE SUMMARY

posed by SOHIO Transportation Company)

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ERRATA

Exhibit G. is in error. Rights-of-way over Federal lands for pipeline purposes would be granted by the Secretary of the Interior under 30 U.S.C. § 185 (Supp. 1975) and other pertinent authority.

IN REPLY REFER TO:

United States Department of the Interior

BUREAU OF LAND MANAGEMENT
WASHINGTON, D.C. 20240

Enclosed is a copy of the Executive Summary for the Final Environmental Statement (FES) covering the development of a crude oil transportation system from Valdez, Alaska, to Midland, Texas, as proposed by the SOHIO Transportation Company.

The Executive Summary is offered as a convenient compilation of information contained in the full FES, summarizing facts about the proposed SOHIO project, and the environmental consequences of that project, to provide information to the public.

The FES was prepared by the Bureau of Land Management pursuant to the National Environmental Policy Act of 1969. Copies of the full FES are available for inspection at depository libraries and county offices along the land route of the proposed system; at the BLM offices in Washington, D.C., Sacramento, California, Phoenix, Arizona, and Santa Fe, New Mexico; the U.S. Army Corps of Engineers District Office, Los Angeles, California, the Port of Long Beach Environmental Offices, Long Beach, California; and the Federal Power Commission, Washington, D.C.

A 30-day waiting period is provided during which the Secretary of the Interior will receive written comments on the FES from interested parties. After due consideration of the FES and appropriate comments, a Secretarial decision will be rendered on the proposal.

MAY 25 1977
Date

Curt Berklund
Director

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DEPARTMENT OF THE INTERIOR

ENVIRONMENTAL STATEMENT

CRUDE OIL TRANSPORTATION SYSTEM: VALDEZ, ALASKA TO MIDLAND, TEXAS

(as proposed by SOHIO Transportation Company)

EXECUTIVE SUMMARY

Prepared by

BUREAU OF LAND MANAGEMENT
DEPARTMENT OF THE INTERIOR

Curt Berklund.
Director, Bureau of Land Management

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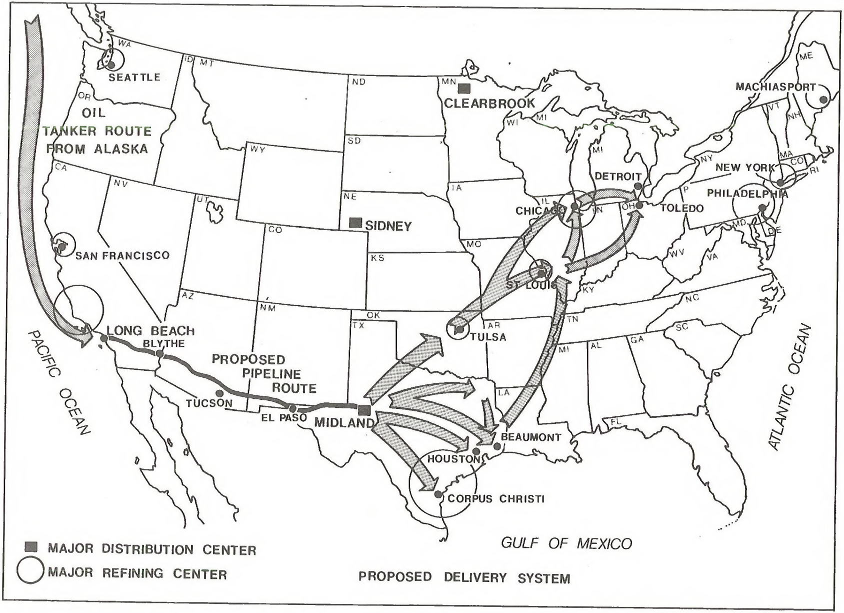


PROPOSED DELIVERY SYSTEM

INTRODUCTION

SOHIO Transportation Company of California, a subsidiary of The Standard Oil Company of Ohio, has filed applications with the U. S. Department of the Interior and several other Federal agencies for permits and certificates necessary to construct and to operate a crude oil transportation system between Valdez, Alaska, and Midland, Texas, using Long Beach, California, as the West Coast port of entry. Permit applications have also been made, or are pending, to the appropriate state and local agencies having jurisdiction in the affected areas of the proposed project. Approximately 700 permits must be secured by the applicant from Federal, state and/or local agencies before the proposed project could commence.

Any application for use of land and water resources under Federal jurisdiction which constitutes "a major Federal action significantly affecting the quality of human environment" requires preparation of a Federal Environmental Statement (ES), under the provisions of the National Environmental Policy Act of 1969.

The U.S. Department of the Interior's Bureau of Land Management was selected as lead agency for preparation of the required Federal ES. The U.S. Army Corps of Engineers prepared an environmental assessment of the proposed Port of Long Beach facilities which was incorporated in the ES by the Bureau of Land Management (BLM).

In summary, this statement sets out facts about the proposed SOHIO crude oil transportation project, and environmental consequences of that project, in sufficient detail to provide information to the public and to assist in decision making.

The ES is structured to comply with the provisions of Section 102(2)(C) of the National Environmental Policy Act of 1969, and contains the following chapter divisions:

Chapter I - _Description of the Proposal_, locating and defining the proposed action.

Chapter II - _Description of the Environment_, discussing the present environment of the subject area as well as the future environment, to year 2000, without the proposed action.

Chapter III - _The Environmental Impacts of the Proposed Action_, assessing direct and indirect impacts of conversion, construction, and operation (short-term, long-term, and cumulative to year 2000).

Chapter IV - Mitigating Measures, including those that are applicant-committed; those that are additionally committed by other agencies; and, those proposed but not committed. Anticipated effectiveness of each measure is included.

Chapter V - Any Adverse Impacts Which Cannot Be Avoided, discussing previously described adverse impacts that may still exist after the application of the committed mitigating measures.

Chapter VI - Short Term Uses and Long-Term Productivity, discussing the extent to which the proposed action involves trade-offs between short-term commitments of resources as a result of the proposal and the long-term maintenance and availability of environmental values.

Chapter VII - Irreversible and Irretrievable Commitments of Resources, summarizing those aspects of the proposed action which could produce such commitments.

Chapter VIII - Alternatives to the Proposed Action, describing and analyzing alternative methods of ochieving the proposed project's purpose, as well as a

"No Action" alternative which does not meet the project objective.

Chapter IX - Consultation and Coordination, describing the methods and results of consultation and coordination effected during preparation phases, as well as a summarization of the public participation hearings, written comments, responses, and their treatment and utilization in the final ES.

Appendices - containing references, bibliography, detailed technical data, and supporting studies.

Map Volumes - containing oversized maps referenced in the separate chapters which depict the route and resources along the proposed transportation route.

In most of the chapters, information is subdivided into such resources as climate, geology, soils, biology, water resources, land and water uses, use plans, controls, and constraints. There are also subdivisions, where appropriate, for construction, operation, maintenance, transportation and utility networks, and socioeconomic conditions affecting each area and phase of implementation.

The Executive Summary is a summarization of each of the chapters in the Environmental Statement and, in narrative form, is divided under the same headings as the full Statement. Where parenthetical references are made to specific chapters, in order to guide the reader to a more complete and more technical description, these references are to chapters in the full Environmental Statement, and not to chapters within this Executive Summary.

CHAPTER I

DESCRIPTION OF THE PROPOSAL

SOHIO Transportation Company of California, a wholly-owned subsidiary of The Standard Oil Company (of Ohio), has proposed development of a marine and land crude oil transportation system between Valdez, Alaska, and Midland, Texas, for initial delivery of Prudhoe Bay crude oil production from Alaska's North Slope field. The proposal includes utilization of The Port of Long Beach as the West Coast port of entry, and as the site of a new common carrier marine terminal off-loading and transferring the crude to a proposed common carrier pipeline system.

SOHIO's proposal involves transportation of up to an initial 700,000 barrels per day (bpd) of raw crude oil in American-owned-and-operated tankers via a 2,200-mile marine route between the Port of Valdez and the Port of Long Beach. The crude would be off-loaded at Long Beach and, along with other West Coast crude surplus, would be transferred into a 1,026-mile pipeline system between Long Beach and Midland. A minimum of 200,000 bpd of crude supply from the proposed project would be siphoned off at the Dominguez

Hills inland storage terminal near Long Beach and distributed to Los Angeles area refineries for use in West Coast markets. The remainder would continue the transport route through the 500,000-bpd-capacity pipeline.

The proposal involves construction of 237 miles of new pipeline, 18 new pumping stations, and about 166 miles of new power transmission lines. The remaining 789 miles of the pipeline route would consist of existing natural gas pipelines which have been proposed for abandonment and conversion to the transportation of crude oil. Conversion of the natural gas pipeline in Arizona, New Mexico and Texas is dependent on abandonment approval by the Federal Power Commission. Conversion of the natural gas pipeline in California is dependent upon abandonment approval by the California Public Utilities Commission. Decisions on the applications for abandonment in both cases are not expected until after the Environmental Statement process has been completed by the Federal Government and the State of California.

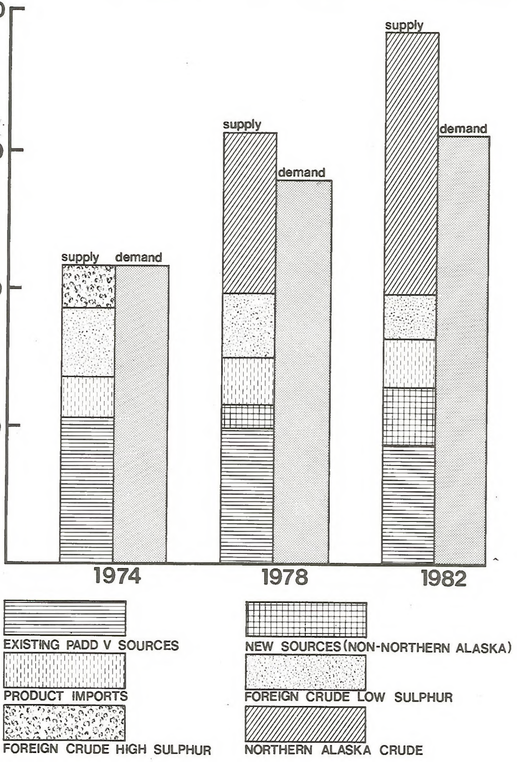
BACKGROUND IN BRIEF

Information submitted by the applicant as part of the necessary permitting process, as well as various independent, state, and Federal studies, indicates the probability that a major surplus of crude oil will develop on the West Coast beginning in 1978. That anticipated surplus has been estimated at 300,000 to 600,000 barrels per day in 1978, increasing to between 750,000 and 900,000 barrels per day by 1982.

New domestic crude sources from Alaska, from Southern California offshore areas, and from the Elk Hills National Petroleum Reserve in Central California, will be arriving at West Coast receiving terminals in increasing amounts as field productions develop. West Coast refineries do not anticipate being able to absorb all the anticipated additional crude supplies, thus creating a surplus in Petroleum Administration for Defense District V (PADD-V), a Federal oil and gas data collection geographic division, which includes Alaska, Arizona, California, Hawaii, Oregon and Washington. Exhibit A (page I-4) shows present and anticipated crude supply in PADD-V during the period 1974-1982.

In other geographic areas of the United States, however, the present crude supply situation is one of domestic deficiency rather than surplus. Alleviation of the disparity could be accomplished by transfer of the West Coast crude surplus to areas of domestic deficiency. SOHIO has proposed the construction and operation of a transportation system to accomplish such a transference, and has indicated its belief

EXHIBIT A



PADD V SUPPLY/DEMAND BALANCE FORECAST

Source: Standard Oil Company of Ohio

that such a project could help to diminish the present national dependence on foreign crude imports.

Source of crude oil supply for the proposed SOHIO project is the company's 53.68 percent share of the 9.6 billion barrels of estimated Prudhoe Bay proven recoverable reserves located on Alaska's North Slope, in combination with anticipated West Coast surplus crude available for transport.

Transportation of production from the Prudhoe Bay unit will be via the 798-mile Trans-Alaska Pipeline System (TAPS), terminating in newly-constructed loading facilities at the Port of Valdez on the south coast of Alaska. Transportation of West Coast crude from an area of surplus to areas of deficiency would be implemented via the proposed Long Beach to Midland pipeline.

Initial throughput of the proposed Long Beach to Midland pipeline is 500,000 barrels per day (bpd). Accommodation of larger volumes of throughput would require an additional pipeline. From an engineering standpoint, expansion of the system could be accomplished by providing additional pumping stations and making pipeline alterations to tie in a second natural gas line, which would have to be abandoned and converted. Such action, however, would be additional to the present proposal and would require new and additional permits and/or certificates, new and additional environmental assessments, and the preparation of new and additional environmental statements for public and governmental consideration.

Initial capacity of the Trans-Alaska Pipeline is 1.2 million bpd, with the design capability of increasing the flow to 2 million bpd. Present plans call for the TAPS line to start-up with a 600,000 bpd flow in July 1977, increasing the flow to 1.2 million bpd by November 1977. Although the pipeline is designed for an ultimate 2-million-bpd flow, Alyeska Pipeline Service Company reports that this could not be accomplished without additional pumps. No schedule presently exists for increasing the pipeline flow beyond the 1.2 million-bpd figure.

Transportation of Prudhoe Bay crude oil would begin at the Port of Valdez, where the crude would be on-loaded to tankers in the 80,000 to 165,000 DWT (dead weight ton) class.

The tanker fleet will conform to existing Federal law (Merchant Marine Act of 1920, Title 46, USC; Sec. 883), commonly known as the "Jones Act," which stipulates that all trade in goods utilizing marine transport between U.S. ports must be carried entirely in ships of U.S. construction, ownership, and operation, and must be manned by American crews.

According to the applicant, the following SOHIO tanker fleet for transport of Alaskan oil to the West Coast consists of vessels owned by Keystone Shipping Company and Interstate and Ocean Transport Company and leased to SOHIO.

SOHIO has indicated a tanker mix of 11 vessels would be sufficient to transport 700,000 bpd of Alaskan crude oil from Valdez to Long Beach. However, analysis in the Environmental Statement indicates that, over the life of the project, a mix of 14 vessels would be needed to transport the amount of oil due to route, time and distance. The difference in amounts of tankers is due to the difference in day-use predicted by SOHIO (345 days) and BLM (320 days).

No. of Vessels	Leased by	Dead-Weight Tons (DWT)	Segregated Ballast	Inert Gas System	Low Sulfur Fuel Capacity
4	SOHIO	165,000	35%[b]	Yes	Yes
3	SOHIO	120,000[a]	35%[b]	Yes	Yes
4	SOHIO	80,000	20%[c]	No[d]	Yes

[a] Tankers will have double hulls and double bottoms to reduce the possibility of piercing the cargo hull.

[b] 35% is the normal dead weight ballast carried by tankers at sea and represents 100% of the ballasting requirement.

[c] Tankers will take on 20% ballast (nonfluctuating) before leaving port and will not adjust until after passing Point Mugu, Calif.

[d] Feasibility studies for inert gas retrofit are underway.

SOURCE: SOHIO Transportation Company of California, 1977.

The table also represents a tanker mix based on port facility designs at Valdez and Long Beach which will not accommodate vessels of less than 70,000 DWT and assumes the most reasonable mix based on distance, economics, and standards to be imposed at Long Beach.

The likelihood and impacts of marine oil spills and pipeline rupture or leaks are important considertions in evaluation of the proposed action. The applicant has prepared Draft Oil Spill Contingency Plans for the port terminal and the pipeline, which will be submitted to the Environmental Protection Agency and to appropriate state agencies for review and approval.

United States Public Law 93-153, commonly known as the "Trans-Alaska Oil Pipeline Act," or the "$100,000,000 Oil Spill Contingency Fund," provides that if "oil that has been transported through the trans-Alaska pipeline is loaded on a vessel at the terminal facilities of the pipeline, the owner and operator of the vessel and the Trans-Alaska Pipeline Liability Fund shall be strictly liable without regard to fault...for all damages, including clean-up costs, sustained by any person or entity, public or private, including residents of Canada, as the result of discharges of oil from such vessel...The operator of the pipeline shall collect from the owner of the oil at the time it is loaded on the vessel a fee of five cents per barrel. The collection shall cease when $100,000,000 has been accumulated in the fund, and it shall be resumed when the accumulation in the Fund falls below $100,000,000."

The applicant's proposed routing for transportation of crude oil from Valdez to Midland can be divided into three segments: a marine route from Valdez to San Pedro Bay, California; port facilities and storage terminals at Long Beach, California; and, a 1,026-mile pipeline land route from Long Beach to a Midland distribution terminal. Upon arrival at the existing mid-continent crude oil distribution center, in Midland, the applicant proposes that the crude could then be moved north into the Midwest, south to the Gulf Coast, or east for connection with other north and southbound pipelines to existing refineries.

A summary of land ownership covering the route of the proposed pipeline between Long Beach and Midland is presented in Exhibit B (page I-10).

MARINE ROUTING

SOHIO has proposed a marine transportation route by tanker directly from the Port of Valdez onloading facilities in Alaska to the Port of Long Beach in California by the shortest, most direct, and most feasible route. Throughout the marine route, the

EXHIBIT B

SUMMARY OF LAND OWNERSHIP
(In Miles)

OWNER	New Pipeline*	Converted Pipeline (SoCal)	Converted Pipeline* (El Paso)	TOTAL MILES*	50-ft. ROW Acres
Federal Land					
National Forests	—	—	2.1	2.1	12.6
Public Lands	42.8	41.6	193.9	278.3	1,669.8
Game Refuges	17.0	—	9.0	26.0	156
Military Reservations	—	—	5.0	5.0	30
National Parks, etc.	—	—	—	—	—
Indian Lands	—	5.2	—	5.2	31.2
State Land	—	—	164.0	164.0	984
Private Land	177.0	73.6	295.4	546.0	3,276
TOTAL	236.8	120.4	669.4	1,026.6	6,159.6

*Includes all new construction mileage for pipeline project.

Source: Williams Brothers Engineering Company, March 1977 ship's master is the sole determinant as to course selection, dependent on weather, traffic, or other prevailing conditions at the time of any given voyage.

In early 1977, SOHIO began discussions with the U.S. Coast Guard with a view to establishing a vessel traffic separation system along the West Coast similar to that which now exists in coastal areas of the North Atlantic Ocean. This system would route tankers 20 miles apart on routes north and south along the West Coast. These recommended routes would be placed on all charts used by tanker masters, and deviation from the charted lanes, except in emergency, would result in action against the vessel master.

The downcoast voyage will take five days from Valdez to Long Beach. Tankers will be under the control of the U.S. Coast Guard Vessel Traffic System (VTS) from Valdez outbound into Prince William Sound. The normal southerly route will take the vessels approximately 250 to 300 miles offshore southern Alaska and British Columbia and approximately 300 to 320 miles offshore the Washington and Oregon coastlines. The tankers will approach the Northern California coast within 140 to 160 miles, narrowing to between 80 and 100 miles offshore Cape Mendocino, and within 50 miles offshore of Point Arena and San Francisco's Golden Gate. Further south, the route passes within 40 to 50 miles of Monterey, 30 to 40 miles offshore the Big Sur and Estero Bay coasts, and within 20 miles offshore of Point Conception prior to entering the Channel Islands area off Santa Barbara.

In the Channel Islands area, the tanker routing could vary from 10 miles, or less, to 30 miles offshore during the approach to San Pedro Bay and the Port of Long Beach.

The U.S. 11th Coast Guard District has proposed a West Coast traffic scheme for tankers traveling between Valdez and Los Angeles/Long Beach. The proposed system would bring southbound laden tankers south of the Channel Islands, while routing northbound empty tankers through the existing vessel traffic lane within the Santa Barbara Channel. The Coast Guard proposal has been presented to local, state and Federal agencies for comment and consideration. At the time of this publication, no decision has been made. There is also the possibility that the present traffic scheme would be left intact with the addition of new LORAN-C stations on the West Coast for precise navigational position. After studying all comments and considerations, the 11th Coast Guard District plans to make recommendations to the U.S. Coast Guard Commandant for decision.

Vessels will normally be in port two days for offloading. The return trip to Valdez takes the same five-day period as the trip from Valdez to Long Beach. Two additional days are needed to on-load for another trip. A complete round trip between Valdez and Long Beach, therefore, would take about 14 days.

LONG BEACH PORT FACILITIES AND STORAGE TERMINALS

SOHIO proposes to construct a crude oil receiving terminal and storage facilities on a 42-acre site at the Port of Long Beach for the purpose of offloading, storing, and transferring incoming Alaskan crude through a 1,026-mile pipeline system. All facilities would be designated "common-carrier" and available to any potential qualified user. Under this designation, the Long Beach to Midland pipeline would be regulated by the Interstate Commerce Commission and/or the California Public Utilities Commission.

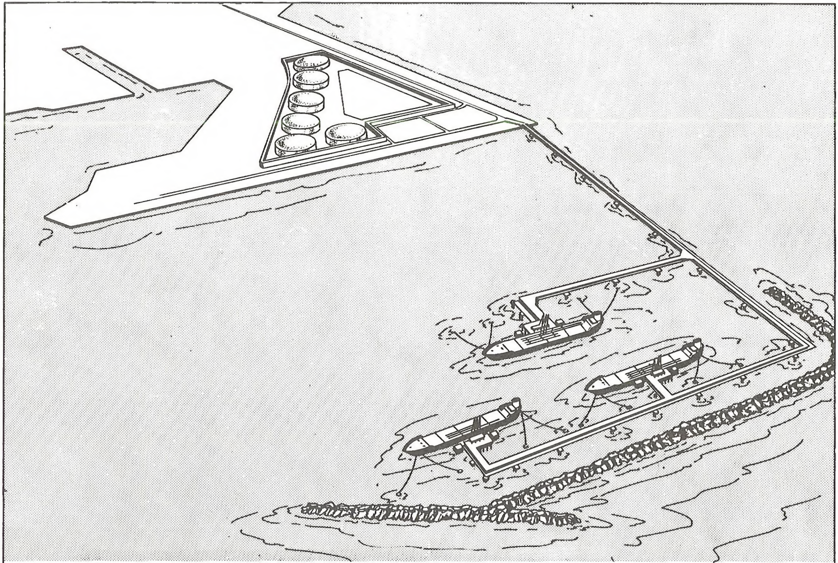
The proposed Long Beach terminal and storage facilities would require all new construction, and would be located approximately 2,500 feet south of, and adjacent to, the Port's existing Pier J facilities. (Exhibit C, page I-15). An additional storage facility, to be located at the Dominguez Hills inland terminal site, would also require all new construction.

Offloading facilities at the Pier J site would consist of three fixed mooring berths for tankers, a pile-supported trestle connecting the facilities to the storage tank farm, and the normal support facilities required for such operation. Berths would be designed to accommodate only tankers of 70,000 DWT or larger. Smaller tankers could not be accommodated at the proposed berths.

To protect the berthing area from wave action on the south (ocean) side, a new breakwater would be constructed requiring approximately 1.25 million tons of rock from the Santa Catalina Island quarries, 200,000 tons of armor rock, and 700,000 cubic yards of spoil material from harbor dredging. Any additional dredging would be outside the scope of this project. It is anticipated that the Long Beach Harbor Department will perform an expanded dredging program as part of the Port of Long Beach proposed General Plan (as yet unapproved by the State of California); however, such expanded dredging would have no connection with the SOHIO proposal under analysis in this document.

Dredging for the proposed project is proposed only in the immediate berthing area, increasing water depth from the present 42 feet to 62 feet, to allow entry and docking of tankers in the 165,000 DWT class. Approximately 2.47 million cubic yards of spoil material would require removal. Some of the spoil would be deposited within retaining walls surrounding the trestle and berthing facilities. Dredge material unsuitable

EXHIBIT C



Artist's View: Long Beach Port Facilities for the berthing area breakwater would be disposed of at an approved U.S. Environmental Protection Agency offshore disposal site or used for land-fill elsewhere in the Port area. The Long Beach Port Authority would be responsible for design of the facilities, for the dredging operation, and for disposal of the spoil.

The three fixed tanker berths would be constructed by the Port Authority, using breasting dolphins which would rest on concrete piles. A series of breasting and mooring timbers of piles would be driven into the ocean bed to protect the pier structure by absorbing impact forces of tankers berthing and unloading. Dockside utilities and water service would be provided for the tankers, but no dockside sewage facilities are planned. Therefore, sewage would have to be kept aboard ship in accordance with harbor regulations which prevent the discharge or incineration of sewage within the harbor area. Low sulfur fuel service for the tankers would be provided at each berth via pipeline.

A pile-supported, concrete, F-shaped trestle, approximately 4,700 feet long, would connect the berthing area to the pier storage terminal. Three 48-inch crude oil transfer lines would offload the oil at the rate of approximately 125,000 barrels per hour. Tanker discharge pressure would be at 125 pounds per square inch gauge.

The berthing area would be opened on either side behind the permanent breakwater to facilitate tidal exchange and oxygenation with San Pedro Bay. Metering facilities will be installed on the berths to measure amounts of oil coming from the vessel and will be the primary means of determining amounts of oil being transported.

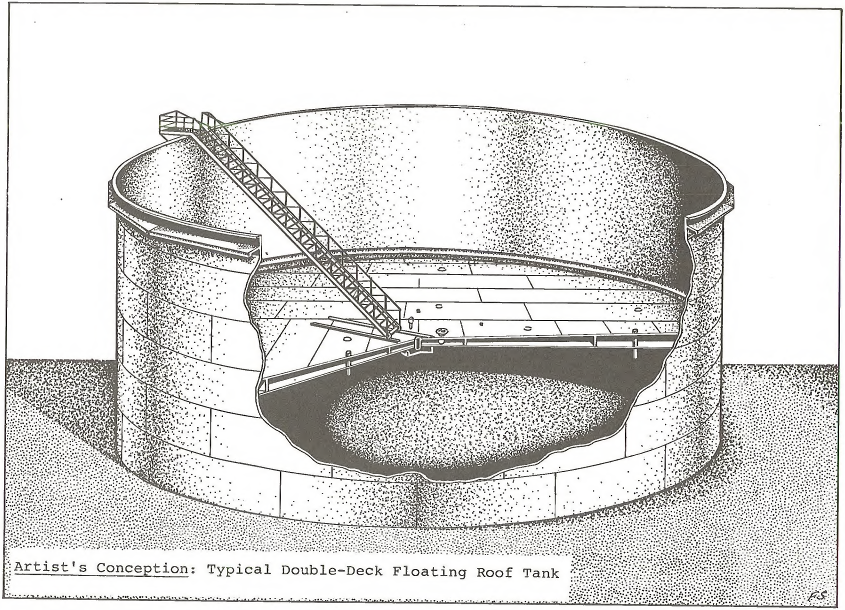
Crude oil storage facilities at the West Coast terminal would be located at two sites: the 42-acre pier site, with a 3.7-million-barrel capacity in the six 615,000-barrel floating roof tanks; and, the Dominguez Hills inland storage site, with 1.3-million-barrel capacity in two 615,000-barrel floating roof tanks.

A 48" diameter pipeline would be constructed from the pier tank farm to the inland storage terminal, a distance of about 9 miles. Pumping and metering facilities would be installed at this site to deliver at least 200,000 barrels a day of incoming crude oil through the existing Four Corners pipeline system interconnecting for delivery to refineries in the Los Angeles and surrounding areas for crude distribution to West Coast markets. The remaining supply, plus other surplus oil, would then be introduced into the proposed new pipeline system extending to Midland, Texas.

All eight storage tanks would be equipped with floating roofs to minimize oil evaporation losses and adverse impacts on air quality. (Exhibit D, Page I-19). According to the applicant, research has not yet been completed to identify the specific type which would be used in the proposed facility. Tanks would be contained behind a reinforced concrete dike. The dike at Pier J would be about 16 feet high and designed to contain 125 percent of the tank capacity in case of tank failure. Fire fighting, control and communication systems would be provided within the area of each facility. An oil-water separator treatment system would be constructed to treat water collected in the catch basin of the dike as well as rainwater collecting on roofs. All water discharged from the treatment system would meet existing water quality standards.

Approximately 16 months would be required for the erection of all eight storage tanks. Upon completion, each tank would be given a hydrostatic test performed at a controlled rate to conform with the foundation design and to accomplish a preloading and test of the foundation as well as the shell.

EXHIBIT D



Artist's Conception: Typical Double-Deck Floating Roof Tank

PIPELINE ROUTING

The pipeline route would begin at Pier J, where a 48" line would be constructed for a distance of 8.9 miles to the Dominguez Hills terminal.

From the inland storage terminal site, pipeline diameter would be reduced from 48" to 42". Construction of the new pipeline from Pier J to Walnut, California, would involve construction activities through the Los Angeles River Flood Control Channels in urban areas for a distance of about 40 miles. Construction time is estimated to be 180 working days, based on 10 hours a day, six days a week, laying about 1200 feet of pipe per day.

From Walnut to Beaumont, California, the 42" pipeline would continue for about 50 miles, laying pipe at the rate of about 2,500 feet per day. Most of the other new construction segments could have pipe laid at the rate of about 5,000 feet per day. Construction in the Walnut to Beaumont segment is expected to take about 119 working days.

At Beaumont, California, the new 42" diameter pipeline would tie into an existing 30" natural gas line now owned and operated by Southern California Gas Company, a subsidiary of Pacific Lighting Corporation. This line has been used for transmission of natural gas from the El Paso Natural Gas Company system, which delivers natural gas from the Permian Basin in West Texas to the California/Arizona Border.

Southern California Gas Company is filing an application with the California Public Utilities Commission (PUC) for permission to abandon approximately 121 miles of 30" gas line between Beaumont and Desert Center, California. SOHIO and Southern California Gas have entered into a lease agreement whereby SOHIO could acquire this line and convert it from east-to-west gas transmission to west-to-east crude oil transmission upon abandonment approval from the California PUC. The activities required to convert an existing gas transmission line to crude oil service are separate and distinct from new pipeline construction and have been fully addressed in the Environmental Statement.

From Desert Center, a new 42" diameter pipeline would be constructed to Ehrenberg, Arizona, a distance of about 37.1 miles which includes the crossing of the Colorado River. Total construction time for this segment is estimated to be 76 working days.

Crossing the Colorado River, the pipeline would be buried in the riverbed at a depth below scour level. Because of width and depth of the river, extra working space would be required for construction activities on a temporary basis. On open ground, the construction right-of-way is 100 feet. Final design of this crossing has not yet been determined, but it is probable that three acres of land would be needed in addition to that required for the upland approach to the river. Extra space, for the most part, would be confined to one side of the river and would involve a land corridor approximately 200 feet wide and 1,200 feet long.

From approximately 25.5 miles southeast of Ehrenberg, Arizona, a new 30" diameter line would be constructed for a distance of approximately 34 miles. Construction has been estimated to take about 36 days. This section would connect the new and existing lines west of this point with the existing 30" natural gas pipeline now owned and operated by El Paso Natural Gas Company extending eastward for approximately 669 miles to Jal, New Mexico.

As with the existing Southern California Gas Company pipeline in California, the Arizona-Texas-New Mexico stretch of the El Paso line would have to be converted from present natural gas transmission between the Permian Basin of West Texas and the California border to crude oil transmission. El Paso Natural Gas Company presently has an application pending before the Federal Power Commission (FPC) to abandon this line, which is one of five presently being used by the gas company and which El Paso declares is excess to supply capacity. FPC approval of the abandonment would permit SOHIO to exercise its option with El Paso and to convert the line to west-to-east crude transmission.

At Jal, New Mexico, the applicant proposes to tie into the existing El Paso line with the construction of a new 42" section of pipeline covering the 73-mile distance to Midland, Texas, where a new terminal storage facility would be constructed. The Jal to Midland segment of the line would take approximately 74 days to complete.

The Midland terminal facility would occupy approximately 71 acres. Four 500,000-barrel, floating-roof storage tanks would be erected to receive crude oil from the pipeline facility. This terminal would also be equipped with metering and pumping installations to make deliveries of crude oil to interconnecting pipelines comprising a distribution system capable of reaching midwestern, eastern, and southern areas of the United States. (Exhibit E, page I-25).

Based on the September 1975, DeGolyer and MacNaughton "Report on Future Oil Producing Rates in the Permian Basin," SOHIO has projected the present pipeline capacity beyond Midland to be 2,000,000 barrels per day (bpd), with excess pipeline capacity of 459,000 bpd in 1978 increasing to 1,373,000 bpd capacity in 1985.

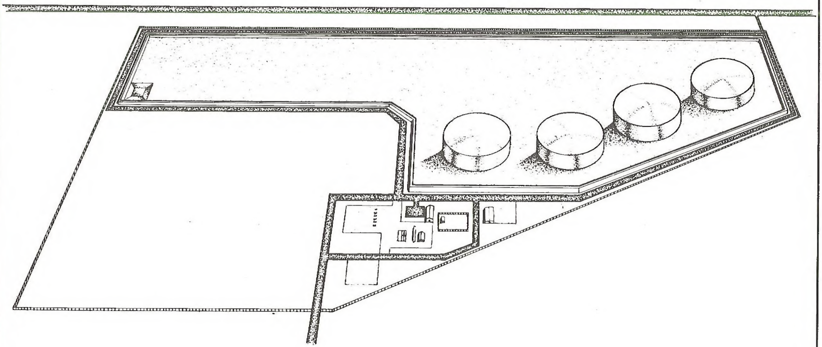
CONSTRUCTION, OPERATION AND MAINTENANCE ESSENTIALS

Throughout the pipeline route, a total of 18 pumping stations have been proposed for new construction at the following sites: Long Beach, Redlands, Indio, and Desert Center, California; Ehrenberg, Livingston, Gila, Casa Grande, Coolidge, Black Mountain, Redington and Cochise, Arizona; Lordsburg, Deming and Anthony, and Pecos, New Mexico; Guadalupe, and El Paso, Texas. (Exhibit F, page I-26).

Horsepower requirements for the pumps would be determined by engineering calculations as specified by pump manufacturers and by displacement demands. The overall size of the pump units is about 7 feet wide, 25 feet long, and 10 feet high. Pump and motor rotation is 1,800 revolutions per minute.

Electrical power requirements would be provided from utility companies in the immediate area of the pump stations over approximately 166 miles of new transmission lines. Battery-powered equipment would be located at all pumping stations to accommodate any electrical failure that would affect communications, remote control equipment, or local instrumentation and control systems.

EXHIBIT E



Artist's Conception: Midland Terminal Storage Facility

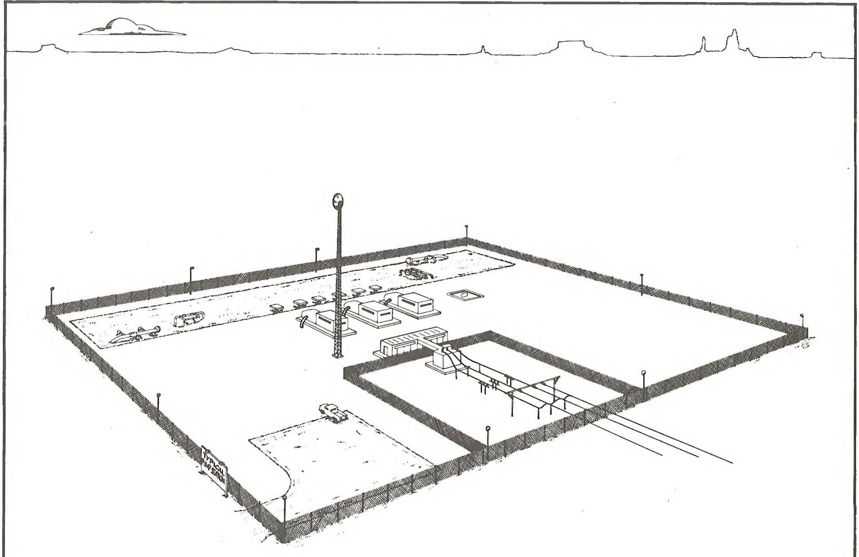
For control of the crude oil system, one control system has been proposed to monitor the West Coast port and terminal operations and a second control system to monitor and control pipeline pump stations and some Midland terminal operations, using a master control center in downtown El Paso. Each control system would have protective devices and remote control units in the terminals and pump stations to monitor crude oil movement.

The computers associated with the two master terminal centers would be programmed to control, monitor, and transmit decisions. In addition, each pump station will have its own system to perform start-stop protective functions independently. Thus, the pump stations could continue to operate safely in the event of a failure in the master terminals or the communications system.

A communications system has been proposed, based on a recently completed microwave system connected to each operating and maintenance location. Circuits would provide point-to-point voice, teleprinter, and data transmission channels. Mobile radio systems would be installed in essential vehicles.

SOHIO has also proposed to locate maintenance bases at both terminals and at Redlands, Ehrenberg, Casa Grande, Lordsburg, and El Paso. These bases would

EXHIBIT F



Artist's Conception: Pump Station

be equipped for handling scheduled maintenance, as well as major and routine repairs on the pump stations, the pipeline, and the terminals.

Some of the old compressor stations now in use by the companies owning the existing gas lines would be removed and the area restored to its natural state insofar as possible. Where feasible, the applicant proposes to use these same sites to locate pump stations.

The new pipeline would be buried at all water crossings except at the concrete-lined watercourse of the Los Angeles River. The existing aboveground water crossing at the San Pedro River is located on support structures which are presently being analyzed to determine structural integrity for carrying the weight of crude oil as opposed to the weight of natural gas.

Special temporary land requirements for pipeline construction would be required for crossing rivers, where the depth of line burial and extra work equipment would require additional working space. For a submerged crossing, the pipe would be buried in the stream or riverbed at a depth below the probable future scour level, using specialized equipment for preparation. Wherever possible, all major stream crossing construction would be scheduled and planned for installation during the normal period of low streamflow.

WATER CROSSINGS OF PROPOSED PIPELINE

Crossing	Description	County & State
Los Angeles River	New, aboveground	Los Angeles, CA
Compton Creek	New, buried (concrete-coated)	Los Angeles, CA
San Gabriel River	New, buried (concrete-coated)	Los Angeles, CA
Santa Ana River	New, buried (concrete-coated)	San Bernardino, CA
San Timoteo Wash	New, buried (concrete-coated)	Riverside, CA
San Gorgonio	Existing, buried	Riverside, CA
Colorado River	New, buried (concrete-coated)	California/Arizona
Gila River	Existing, buried	Maricopa, AZ
Santa Cruz River	Existing, buried	Pinal, AZ
Florence Canal	Existing, buried	Pinal, AZ
Florence-Casa Grande	Existing, buried	Pinal, AZ
San Pedro River	Existing, aboveground	Pima, AZ
San Simon River	Existing, buried	Cochise, AZ
Dry Lake	Existing, buried	Hidalgo, NM
Rio Grande River	Existing, buried	Dona Ana, NM
Pecos River	New, buried (concrete-coated)	Eddy, NM

The existing gas lines would be hydrostatically tested with water, as required, to determine ability to handle crude oil throughout. If any portion of the line does not test out in accordance with prescribed pressures, the applicant proposes to replace that portion with new line.

Meters would be installed at selected pump stations to measure flow rates through the stations. A computer would be installed to trigger alarms if analysis shows a differential flow rate or possible leak. Eleven such meters and computer monitors are proposed for strategic placement throughout the entire system.

A total of 107 main-line valves would be included with the main pipeline system, in addition to the valves located within the pump stations.

The pipeline system would include motor operated valves to regulate the flow of the crude oil. Pressure control valves would also be provided in order to control pressures and flow rates throughout the system. Operating pressure of the line will be determined when final pipeline design has been completed by the applicant.

The capacity of the pipeline is 500,000 barrels per day. Calculations on the amount of oil the pipeline will hold are listed herein by diameter for computation purposes:

48" diameter pipe holds 94 gallons per foot

42" diameter pipe holds 71.97 gallons per foot

30" diameter pipe holds 36.72 gallons per foot

The API gravity, or "weight," of Prudhoe Bay crude oil has been estimated by the American Petroleum Institute to be 27.2; average sulfur content 1.2 percent. Average temperature of the crude while enroute in the proposed pipeline would be approximately 100 degrees Fahrenheit.

ABANDONMENT AND DISPOSAL OF SYSTEM

At a future date the proposed pipeline system could be taken permanently out of service and removed. If this condition should occur, the pipeline and its related facilities would be abandoned and disposed of. This would entail complete draining, disconnecting, and dismantling the entire system. All local, state, and Federal requirements would need to be met. Required reports would document the preparations for a safe and efficient abandonment procedure as specified by technical, fiscal, and legal professionals. A complete description of abandonment procedures and requirements may be found in Chapter I of the full Environmental Statement. Use of marine facilities and harbor modifications located at the Port of Long Beach revert to the Port, but the crude oil handling facilities would not be taken out of service unless specific arrangements are made with Port management.

AUTHORIZING ACTIONS

The proposed project would require discretionary permits prior to construction from numerous Federal, state, and local jurisdictional agencies. A list of Federal agencies having project approval requirements may be found in Exhibit G, pages I-33 - 36. Some of these agencies could require hearings in addition to those for the Federal Draft Environmental Statement.

In addition to Federal authorizing actions, the states of California, Arizona, New Mexico, and Texas require permits for various components of the SOHIO proposal.

Each regional and local governmental agency (county and/or city) with discretionary permit authority is required to issue permits prior to start-up of construction activities; for example, those agencies with permitting authority for construction and/or operation under various building codes, zoning ordinances, and general or special plan requirements.

INTERRELATIONSHIPS WITH OTHER POLICIES, PLANS AND PROJECTS

The applicant's proposal for establishment of a crude oil transportation system is not limited to the transportation of Alaskan Prudhoe Bay production, but also considers the transportation of crude oil from other West Coast sources: the Elk Hills National Petroleum Reserve in Central California; Southern California Outer Continental Shelf reserves; or California state-owned tidelands.

EXHIBIT G(a)

Federal Agencies or Agency Subdivisions Having Project Approval Requirements

DEPARTMENT OR INDEPENDENT AGENCY	Responsible Agency or Subdivision	Activity Requiring Approval	Form	Reference
U.S. Department of Agriculture	Forest Service	Pipeline construction across Coronado National Forest, Arizona	Special use permit	36 CFR 251.50, et seq.
	Forest Service	Road construction or use of any roads in Coronado National Forest, Arizona	Permit	36 CFR 212.10
Department of the Army	Corps of Engineers	Dredging of Port	Permit for work in navigable waters	33 CFR 209.120
	Corps of Engineers	Construction of breakwater docks at Port	Permit for work in navigable waters	33 CFR 209.120
	Corps of Engineers	Pipeline construction across Colorado River	Permit for work in navigable waters	33 CFR 209.120
	Corps of Engineers	Pipeline construction across Departmental lands	Easement	32 CFR 552.50, et seq.
Environmental Protection Agency		Transfer piping to surge tanks	Permit to construct	Oil Pollution Prevention, 40 CFR 112
		Installation of surge tanks	Permit to construct	New Source Review 40 CFR 52.233
		Installation of surge tanks	Permit to operate	New Stationary Sources, 40 CFR 60

DEPARTMENT OR INDEPENDENT AGENCY	Responsible Agency or Subdivision	Activity Requiring Approval	Form	Reference
Environmental Protection Agency (Continued)		Transfer piping to storage	Permit to construct	Oil Pollution Prevention, 40 CFR 112
		Installation of storage tanks	Permit to construct	New Source Review, 40 CFR 52.233
		Operation of storage tanks	Permit to operate	New Stationary Sources, 40 CFR 60
		Operation of pumping equipment	Permit to operate	New Stationary Sources, 40 CFR 60
		Wastewater discharges	Permit	33 CFR 209.120
Federal Communications Commission	Safety and Special Radio Services Bureau	Permit to operate micro-wave transmission towers	Notification of operation	Communications and Satellite Act, 1962, 76 Stat. 419; USC 701; 744
	Safety and Special Radio Services Bureau	Operations requiring extensive radio communications	License	47 CFR Chapter 1
Federal Power Commission		Termination of facilities or service	Filing	The Natural Gas Act, August 1, 1967, Subsection 157.18
U.S. Department of the Interior	Bureau of Land Management	Pipeline construction across public lands administered by the BLM	Easement	43 CFR 2800 and 2880 43 CFR 288 (pending)
	National Park Service	Pipeline construction crosses National Park land	Easement	36 CFR 5.7

EXHIBIT G(b)

DEPARTMENT OR INDEPENDENT AGENCY	Responsible Agency or Subdivision	Activity Requiring Approval	Form	Reference
U.S. Department of the Interior (Continued)	Bureau of Reclamation	Pipeline construction across Irrigation Districts	Amended Easement	43 CFR 230
	Bureau of Indian Affairs	Pipeline construction across tribal, individually owned and Federally owned Indian lands on the Morongo and Agua Caliente Indian reservations, California	Easement	Rights-of-Way over Indian lands, 25 CFR 161
	Fish and Wildlife Service	Pipeline construction across Colorado River	Easement	Regulations pertaining to rights-of-way 43 CFR 2800
	Fish and Wildlife Service	Pipeline construction across Kofa Game Range, Arizona	Easement	50 CFR 291
Department of Transportation	Federal Aviation Administration	Permit to construct microwave transmission towers	Notification of construction	DOT 80 Stat. 932
	U.S. Coast Guard	Pipeline construction crossing navigable waters	Permit	33 CFR 115
	U.S. Coast Guard	Design and operation of private aids to navigation	Review/approval	33 CFR 66
	U.S. Coast Guard	Operation of marine facility	Approval of operation	

EXHIBIT G(c)

DEPARTMENT OR INDEPENDENT AGENCY	Responsible Agency or Subdivision	Activity Requiring Approval	Form	Reference
Department of Transportation (Continued)	U.S.Coast Guard	Oil transfer operation between vessel and facility	Review/approval	33 CFR 126-154-156
	U.S. Coast Guard	Safe shipping practice	Review/approval	33 CFR 126-30-40
	U.S. Coast Guard	Large oil transfer facilities	Approval	33 CFR 145
Department of State	International Boundary and Water Commission	Pipeline construction across Rio Grande, New Mexico	License	22 USC 277

EXHIBIT G(d)

Elk Hills National Petroleum Reserve -- The U.S. Navy is mandated by Congress to develop and distribute crude oil from the National Petroleum Reserve at Elk Hills, California, by April, 1979. To distribute this expected 250,000 bbl/d, the Navy is considering three potential pipeline delivery systems:

1. Elk Hills to Port Hueneme, California, pipeline (includes port terminal facilities to further distribute crude oil by tankers).
2. Elk Hills to the San Francisco Bay area via pipeline.
3. Elk Hills to Redlands, California, via pipeline connecting to a 42-inch portion of the proposed SOHIO pipeline.

An Environmental Impact Statement on the transportation of Elk Hills reserves is being prepared by the Navy. The most desirable route presently appears to be the Redlands connection to SOHIO's proposed west-to-east pipeline. Navy and SOHIO representatives have held preliminary discussions on the feasibility of the Redlands tie-in, but no firm commitments have been made.

Outer Continental Shelf Reserves -- Development of Federal leases offshore Southern California would involve coastal tanker traffic greater than the tanker mix assumed as reasonable for transportation of Prudhoe Bay crude oil to Long Beach.

Recent Federal action in leasing OCS tracts under Lease Sale 35 and the future possibility of tracts being leased under the provisions of OCS Lease Sale 48, where nominations have been called for along the California coast from Point Conception south (with the sole exception of Santa Monica Bay), would interrelate with the applicant's proposal.

Federal approval has been given, and development is now underway in the Hondo Field of the Santa Ynez unit offshore Santa Barbara. Production is expected to begin in early 1978, and transportation would be part of the tanker mix between the San Francisco and Long Beach coastal areas.

In addition, OCS Lease Sale 39 in the Gulf of Alaska may relate to the proposed tanker traffic. The tracts are located immediately south and east of Prince William Sound. The significance of the OCS development program in relation to the SOHIO proposal depends upon the likelihood of finding and developing proven oil and natural gas reserves.

State Plans and Policies -- Various resource agencies of the State of California also have plans and/or policies affecting both public and private land

and water use, which are either presently in effect or would be in effect by the time the applicant proposes to begin construction. These include such statewide programs as the California Coastal Zone Conservation Plan; the State Lands Commission tidelands oil and gas leasing program; and, the Coastal Conservation Fund program for public acquisition of water-oriented lands.

Arizona state authorities have discussed with the applicant the possibility of taking crude oil deliveries from the proposed pipeline to supply some future refinery in Arizona. However, at present, there are no plans and no pending applications for such a refinery in Arizona.

A similar request of the applicant for crude oil delivery from the proposed pipeline has been made by the State of New Mexico. However, no project or project sponsor to develop such a refinery in New Mexico has been identified.

The State of Texas has disclosed no known plans or programs to which the proposed project would relate.

In addition to state agencies' plans and policies, many counties and cities along the route, and in the area of the proposed pipeline, have existing general plans with recently added requirements covering scenic highways, noise, seismicity, open space, and conservation determined by state law. The proposed project would have to conform to such plans and implementing ordinances, or be granted variances from local authorities, in conjunction with permit issuance.

OTHER ENERGY PROJECTS PROPOSED OR UNDER STUDY

Several contemporary energy projects are being considered by private industry which would interrelate with the proposal, as presented, in terms of energy and environmental scope.

Sun Desert Nuclear Plant -- Proposed by San Diego Gas and Electric Company, the plant would be located south of Blythe, California, with transmission lines crossing the desert from the plant in the same general geographic area as the proposed pipeline.

Vidal Nuclear Power Plant -- A proposed nuclear generating station of about 1,540 megawatts would be located a few miles east of Vidal Junction, California, and across the Colorado River from Parker, Arizona.

Palo Verde Nuclear Plant -- Proposed to be located about 40 miles west of Phoenix, Arizona, with transmission lines extending across Arizona into California and New Mexico in the general area of the existing pipeline corridor.

Arizona to Texas 345 kv Transmission Lines Project -- The Public Service Company of New Mexico has applied to the Federal Bureau of Land Management for rights-of-way to construct two 345 kv transmission lines eastward from a Tucson Gas and Electric Company substation in Greenlee County, Arizona (following a route near the existing pipeline corridor) across New Mexico, and into El Paso, Texas. The Federal Final Environmental Statement on this proposal was approved, and permits issued in 1976.

POSSIBLE FUTURE ACTION BY SOHIO

The SOHIO Transportation Company of California has indicated the possibility of a second phase for the project which would involve abandonment of a second 30-inch natural gas pipeline currently in use. If and when such an expansion need occurred, it could be accomplished by adding additional pump stations and making pipeline alterations to tie-in the second natural gas line, creating capability for an increase in throughput capacity.

As stated earlier, however, any such expansion would be considered a separate action, with additional permits required and full environmental assessment procedures applied.

CHAPTER II

DESCRIPTION OF THE EXISTING ENVIRONMENT

This chapter describes the environment in the area concerned as it exists today, and includes a section on the future environment of the area as it might be at the year 2000 without the proposed action.

CLIMATE

The proposed project traverses three climatic regions. The marine route starts in the Northern Pacific and terminates in the Southern Pacific Coastal Region, including the Los Angeles Air Shed; the pipeline route starts in the Southern Pacific Coastal Region, crosses the Intermountain Plateau Region and terminates in the Great Interior Region east of the Rocky Mountains.

General air circulation in the northeastern Pacific Ocean is controlled by two major systems: the Aleutian Low and the North Pacific Subtropical High. Violent winds frequently occur on the lee side of the coastal mountain range around the Gulf of Alaska. A significant percentage of freezing temperatures are recorded in the Gulf from November through March; the warmest temperatures and lowest seasonal ranges are found in the Southern California portion of the marine route.

High waves frequently occur in the northern Pacific Ocean, with less frequency south of the Canadian-U.S. border. The percentage frequency of restricted visibility (less than two miles) reaches a maximum over most of the summer months, while Southern California areas peak in the fall or early winter season. Coastal fog is so localized that it is not reflected in most ship area summaries.

At the ice-free port of Valdez, the Chugach Mountains to the north serve as a natural barrier and northern boundary to the climatic region around the Port. The Gulf of Alaska moderates wintertime temperatures in the area, making the Port of Valdez much warmer than the area immediately north of the mountains. Snowfall ranges between 250 and 350 inches each year. Precipitation is heavy, an equivalent 60 to 90 inches annually. During the summer months, about three days in seven are clear to cloudy. In late winter, about four days in each week are clear to partly cloudy.

The region containing the Port of Long Beach terminal facilities is noted for a mild climate, with relatively low rainfall, and unusually stable air. Temperatures are moderate and air is stabilized under the influence of the ocean. From June to September, the usually smoggy season, strong temperature inversion layers which confine pollutants are the norm. Wind off the ocean is often light, and there is little rainfall. As a result of the trapping effect of abnormally low density air, which caps heavy, moist marine air and prevents the dilution of pollutants, the region has a long history of air pollution. Oxides of nitrogen and hydrocarbons are a special problem in the Los Angeles basin; they react under the influence of ultraviolet sunlight to form ozone and other photochemical oxidant compounds.

The proposed pipeline route enters the Intermountain Plateau at San Gorgonio Pass, crossing the basin at the 1,000 to 2,000 foot level until it quickly rises to about 4,000 to 5,000 feet north of Tucson. This region has an arid, continental climate.

The proposed route enters the south end of the Great Interior Climatic Region at Guadalupe Pass at 5,000 feet dropping to about 3,000 feet as it progresses to Midland. The climate is quite similar to that of the eastern extreme of the Intermountain Plateau. The pipeline route intersects the Continental Divide between the cities of Lordsburg and Deming, New Mexico.

AIR QUALITY

The following observations are pertinent to air quality at Valdez: (1) approximately 60 percent of summer days experience weak wind conditions; (2) at almost all times there is a low thermal inversion lid of 750 feet or less; (3) skies are clear or partially cloudy at least three days per week.

In 1975, small tankers called at the Port of Valdez about every other day on the average. Tanker hydrocarbon emissions were estimated to have been minor because ballasting in port has been infrequent.

It has been assumed in this analysis that the completion of the Valdez crude oil loading terminal and the projected flow of Prudhoe Bay crude oil through the Port of Valdez are independent of the SOHIO proposal under assessment. It was also assumed that the market for Prudhoe Bay oil will exist with or without the proposed SOHIO transportation system.

Air quality at sea is good and typical of world average. Air pollution levels rise in coastal areas, especially near urban centers. Pollutants migrate to sea, often at night or in a thermal inversion layer and often return to land directly or after migrating along the coast. These phenomena are complex and poorly documented because of limited data. Pollutants released along sea lanes in coastal waters affect local air quality. The pollutants are diluted and dispersed as they move onshore.

In the Los Angeles Air Shed, high total suspended particulate levels in excess of air quality standards are common along the proposed project route. Vehicular sources account for approximately half of all photochemically reactive hydrocarbon emissions and for more than half of all emissions of oxides of nitrogen. Power plants and refineries are the largest stationary sources.

The local ambient hydrocarbon concentrations are of particular concern because they form the background against which the hydrocarbon emissions from the proposed action will be assessed. However, the South Coast Air Quality Management District (formerly the Southern California Air Pollution Control District (APCD)) has not routinely measured hydrocarbon levels in Long Beach since 1966. The Long Beach area is generally upwind of emission sources in the Los Angeles Air Shed and enjoys better than average air quality. Nevertheless, the area is highly industrialized and contains numerous pollution sources.

The Los Angeles Air Shed does not meet the Federal air quality standards for several air pollutants; therefore, is classed as a Non-Attainment Area. The Environmental Protection Agency (EPA) has delegated "Implementation Planning" to the states to attain and maintain legislated air quality goals; further delegation of responsibility was made to local agencies without loss of state responsibility.

The purpose of implementation planning is to effect a net reduction of emissions in a way that improves air quality, while allowing a reasonable growth in new emission sources. To counter the adverse impact of new growth in emissions, the EPA published in the Federal Register (41/55524-55560, Dec. 21, 1976) interpretive rulings for review of new "major" sources with a permit requirement for emission "offsets" (also called "trade-offs"). These offsets would have the effect of substituting new technology facilities for older facilities. The trade-off in emissions must be more than one-for-one, so as to result in an improvement in air quality. Additionally, a measure already scheduled in the implementation plans cannot be used as a trade-off.

The California Air Resources Board, as part of its implementation planning, adopted for the air shed more restrictive new source review rules to be enforced by the local South Coast Air Quality Management District. One ruling requires that emissions from tankers be considered as part of the emissions from the stationary source.

GEOLOGY

In Southern California, the proposed pipeline routing crosses major earthquake fault zones, where significant differential displacements are possible. There are no known active faults likely to produce a displacement of the ground surface along the pipeline alignment between the Colorado River crossing and Midland, Texas.

MARINE WILDLIFE

Alaskan waters contain key commercial fisheries which, as food stock, provide one of the key resources of the state. Vigorous commercial fisheries have existed there for more than 20 years. In addition to the established commercial productions of King and Dungeness crab, salmon, shrimp, scallops and clams are extensive in the area. Tanner crabs are the basis for one of Alaska's newest fisheries. Undeveloped commercial stocks have also been identified in the western Gulf of Alaska, but the catches are not as high as those for commercial species. A complete description of wildlife in the area can be found in Chapter 2 of the full Environmental Statement.

In the western Gulf of Alaska, mature salmon and steelhead return from the ocean and enter freshwater streams to spawn in late summer and early autumn. King crab rank with salmon as one of the most valuable commercial species harvested from the western Gulf area.

The U.S. Bureau of Commercial Fisheries found Pacific cod to be most abundant at depths less than 90 meters in the Gulf of Alaska and Alaska Peninsula waters. The Food and Agriculture Organization of the United Nations (1972) estimated the maximum sustainable annual yield of this species in the entire northern Gulf of Alaska to be 30,000 metric tons.

Coastal and Northern California waters can be considered cold temperate. Southern California waters are warm temperate, with the transitional waters helping to increase the number of fish species as one proceeds south along the California coast. Between Oregon and San Francisco, 333 species of fish in 102 families are known.

In the Los Angeles-Long Beach Harbor complex the protected harbor, abundant food, increased productivity, and diverse bottom-type contribute to a rich fish population. Annual productivity is estimated at 56 percent of the standing crop of fish in the complex, which ranges from 1,545,000 pounds to 3,520,000 pounds. Species diversity and richness increase from the inner to the outer harbor due to increased water circulation. The inner harbor serves as a nursery ground for croakers and anchovies and as a breeding area for several other species.

The harbor is highly developed and generally does not provide nesting sites for water and shore birds, so the avifauna consists of fall or spring migratory transients or concentrations of non-breeding birds. The only water-associated birds that could potentially nest in the port area are the killdeer and least tern.

ENDANGERED, RARE, THREATENED SPECIES

All eight of the Federally-classified endangered species of whales (fin, humpback, sei, sperm, blue, gray, right, and bowhead), as well as the Federally-classified endangered American peregrine falcon, short-tailed albatross, Aleutian Canada Goose, light-footed clapper rail, California least tern, and Belding's Savannah sparrow, could potentially be affected by oil pollution along the tanker route and in the ports of Valdez and Long Beach. Oil spills during the nesting season could adversely affect reproductive success, as well as feeding habitats. The California sea otter was added to the Federal Threatened Species list in January, 1977.

Species classified by the State of California as rare, and which could be adversely affected by oil pollution, include the California black rail, the Guadalupe fur seal, and the island fox.

No threatened or endangered nonavian animals inhabit the port area. The California brown pelican, listed by the California Department of Fish and Game (1974) as endangered, is among the most abundant species in the Los Angeles and Long Beach harbors. The California least tern, also on the endangered list (1974), feeds in the harbors.

In the immediate area of the pipeline route, the Federal Government recognizes three endangered species of fish; seven endangered species of birds; two endangered, and one threatened, species of mammals. The States of California, Arizona, New Mexico, and Texas have designated 12 fishes, four amphibians, 16 reptiles, 33 birds, and 18 mammals, as having rare, threatened, or endangered status. Most of the species having federally protected status are also included in the various state lists.

The existing pipeline encounters an area of excellent Desert Bighorn Sheep habitat in the Dome

Rock Mountains of Arizona, crossing the route utilized by the sheep in their seasonal movements.

The only major aquatic habitat crossed by pipeline route, within the Yuma Desert Biome, is a portion of the Gila River just downstream from Gillespie Dam. From the proposed crossing at the Gila River, south along the Gila Greenbelt to Red Rock Reservoir, is some of the most productive wildlife habitat in the Yuma Desert Biome along the proposed pipeline route. This is especially true for the three most hunted species: white-winged dove, mourning dove, and Gambel's quail.

CULTURAL RESOURCES

Much of the area through which the pipeline is proposed to pass has become a major transportation and utility corridor, while various adjacent areas have been and are being used for mining, military, agricultural and recreation purposes.

ARCHAEOLOGICAL RESOURCES

The geographical distribution of archaeological study sites throughout the California Desert, the diverse environmental settings, and the great variety of chronological and cultural assumptions are more than adequate to substantiate the wealth, abundance, and significance of heritage resources along the California portion of the pipeline route.

Information on existing archaeological sites in Arizona was obtained from the appropriate state agencies and from survey data developed during construction of the existing El Paso Natural Gas Company pipeline.

New Mexico has been a focus of archaeological research for the past 90 years with most of the actual work having been done in the northern and northwestern parts of the state. An environmental study of alternative transmission line routes in the Lordsburg-Deming corridor was prepared by the New Mexico Environmental Institute in January 1974, and contains what little site-specific archaeological record exists for areas in close proximity to the proposed pipeline route.

In the Deming area, several archaeological sites have been found. Specific site location descriptions are on file with the Museum of New Mexico in Santa Fe and with the Department of Sociology and Anthropology of New Mexico State University in Las Cruces.

The Texas Historic Commission has identified five National Register archaeological sites near the proposed pipeline route in El Paso County. In addition, El Paso Natural Gas Company has noted Indian ruins within the Hot Well site area. An extensive archaeological field reconnaissance study is presently underway in the vicinity of the proposed pipeline near Fort Bliss and is being conducted by the El Paso Bicentennial Museum. Results of this study are not yet available.

VISUAL RESOURCES

San Pedro Bay, encompassing the Ports of Long Beach and Los Angeles, is not only a major deepwater commercial shipping harbor, but also an outstanding visual resource for the city of Long Beach and the greater Los Angeles urban area. Pier J is within the foreground-middleground visibility zones for sail and power boaters east of the Port complex.

The California Coastal Plan defines policies and guidelines for coastal appearance and design. Applicable policies and guidelines include:

"Design Development to Protect Coastal Viewshed": "...new development shall be designed so that the viewshed quality...can be enhanced by addition of attractive improvements."

"Design Guidelines - Utility Structures": pertains to undergrounding of distribution and transmission facilities.

The proposed pipeline route from Pier J in Long Beach Harbor through Los Angeles County follows flood control channels of the Los Angeles River, Rio Hondo and San Jose creeks, largely lacking in scenic and natural values but used for recreation.

The proposed inland storage tank farm is located in an industrial area. Through San Bernardino and Riverside counties, the corridor traverses a mixture of irrigated croplands and orchards interspersed with residential, industrial and commercial developments, and an extensive road grid.

From the Colorado River in Arizona to the Kofa Game Range, overall scenic quality along the pipeline route is moderately high, containing such visually sensitive areas as Interstate 10 and U.S. Route 95, both heavily trafficked tourist routes, and the heavy recreational areas along the Colorado River and the La Posa Plain. Scenic quality through the Game Range and the Eagle Mountains is also moderately high. The pipeline corridor crosses the Gila River green belt, an area of moderately high scenic quality. East of Coolidge, overall scenic quality is moderately high as a result of picturesque desert vegetation. Within the visual corridor of the existing pipeline, areas of visual sensitivity include the Galiuro Wilderness and the Mount Lemon Recreation area of the Coronado National

Forest. From Willcox to the New Mexico state line, vegetation is largely desert yucca-mesquite grasslands, with some agricultural use.

From Lordsburg, New Mexico, to the Texas state line, the existing pipeline corridor is largely routed across broad flat plains. Within the visual corridor of the existing pipeline, the only area of visual sensitivity would be Interstate 10 which carries a heavy tourist traffic. Between the Pecos River and Jal, New Mexico, the only area of significant scenic value crossed by the existing line is the Pecos River. The area has open space value and the existing pipeline scar is a significant visual intrusion.

Much of the existing pipeline route crosses areas of low visual sensitivity and there are no areas of significant scenic value in the corridor path from the New Mexico border to Midland, Texas.

The proposed Midland terminal is located in an existing industrial tank farm near agricultural lands. Scenic values are relatively low, but the site is a part of the foreground visibility zone of Interstate Highway 10 and U.S. Highway 80.

LAND AND WATER USES

Portions of the two Indian reservations--the Morongo and Agua Caliente in the vicinity of Banning, Palm Springs and One Thousand Palms, California--would be traversed by the proposed project. The areas are primarily limited to grazing and outdoor recreation use. Various utility lines, Interstate 10 and the Southern Pacific Railroad cross both reservations.

Inland reserves or refuges include Joshua Tree National Monument, the southern boundary of which lies to the north and within 200 feet of the proposed alignment. Other Federal lands in California along the proposed route do not have refuge or reserve status but have been put to intensive recreational use or mineral development. The BLM-administered area of the proposed pipeline alignment will remain open to off-road vehicles with conservation management controls.

In Arizona, the Kofa Game Range east of the Colorado River in the Kofa Mountains is particularly important as a habitat for the Desert Bighorn Sheep. The outer periphery of the game range and the adjacent public lands are also used intensively for winter-oriented recreational use.

An approximate two-mile portion of the Coronado National Forest in Cochise County, Arizona, is traversed by the existing El Paso pipeline. No Federal or state reserves or refuges are located along the proposed alignment in New Mexico except for the National Resource

Lands administered by BLM or lands administered by the New Mexico State Land Commissioner. From New Mexico into Texas, the existing line stretches across the northern edge of Franklin Mountains Wilderness Area and crosses Fort Bliss Military Reservation northeast of El Paso. No other Federal or state reserves are noted along the rest of the route to Midland.

AGRICULTURE AND GRAZING

Extensive and diversified agriculture lies along certain portions of the pipeline route from the Los Angeles Basin to Blythe. The pipeline route in the three-county region traverses areas which are approximately 29 percent planned urban and 71 percent planned nonurban uses. Agriculture in the southwestern states of Arizona, New Mexico, and Texas is based on present water supplies, and will be limited to present levels unless supplemental water becomes available.

UTILITY NETWORKS

Transmission facilities crossings decrease from west to east concurrent with the decrease in urbanization (similar to highways, roads, and railroads).

LONG BEACH AREA

The Port of Long Beach is one of two major harbors which occupy San Pedro Bay; the other is the Port of Los Angeles, separated only by a city boundary marker yet they have experienced substantially different growth patterns. Together, the two ports form the largest manmade harbor in the world.

During the past 15 years, Long Beach's share of total San Pedro Bay cargoes has increased from less than 30 percent to more than 50 percent. The total value of cargoes handled by the Port of Long Beach had increased from $221 million in 1949-50 to $1,763 million in 1969-70. The growth in traffic at the Port has resulted in its becoming the busiest port on the West Coast. It is also the third busiest container port in the United States, surpassed only by New York and Oakland.

EMPLOYMENT

A survey of the available work force along the pipeline route indicates that there would be an adequate supply of workers both for construction on the proposed project and for the maintenance crews, as well as adequate housing units available. Some of the maintenance personnel may already reside in the areas where they will be needed.

ENERGY SUPPLY AND DEMAND

The present national oil supply situation is characterized by the following:

-The United States currently imports from foreign nations over 42.3 percent of the oil it consumes (API, 1977), an increase over the winter of 1973-74.

-Price controls on domestic production have been in effect since 1973.

-Proven reserves have been steadily declining since 1970 (although nearly 10 billion barrels were added to proved reserves in north Alaska in 1970, no oil has yet been produced).

-Federal leasing of Outer Continental Shelf (OCS) has been slowed down, pending Secretarial review.

-Drilling effort for oil has been increasing since 1972, after declining for 15 years.

-The rate of increase in domestic oil consumption has declined slightly from 1973 levels.

Of the 27 billion barrels of undiscovered, recoverable resources estimated by the U.S. Geologic Survey (USGS) to exist onshore and offshore in Alaska, the overwhelming share of the potential stems from northern Alaska. In turn, about 9.6 billion barrels in the Prudhoe Bay field is well-assured with respect to its actual existence and its economic viability.

SOHIO proposes to transport its allotment of Prudhoe production to the West Coast with a portion of that allotment being siphoned off to supply West Coast markets, backing out some high-sulfur volume crude. The remainder, along with other crude surplus to the West Coast, would be transported to Midland, Texas, where production in the Permian Basin field is declining. Surplus supplies would then be distributed to oil-short markets in the midwest, the north, and the east, via existing pipelines.

NATURAL GAS

Since 1968, the Lower 48 states have been consuming more natural gas each year than producers have been finding in the form of new reserves. Except for 26 trillion cubic feet discovered in Alaska in 1970, annual additions to reserves have failed to equal marketed production for the past seven years. Moreover, Alaskan reserves will not provide significant amounts of gas until transportation facilities have been constructed.

The State of California, for many years, has received the major portion of its natural gas supply from production in the Permian Basin of west Texas. Gas supplies in that basin are declining, along with crude supplies. This decline creates a decrease in supplies available for shipment to California. With the traditional supplies of natural gas to Southern

California declining more rapidly than anticipated, new avenues are being pursued by California to supplement and/or replace the historic source.

ELECTRIC POWER

Higher fuel costs, combined with already escalating plant construction and operating costs, have escalated electricity rates. With today's oil prices and the natural gas shortages, the economics of new generating plants has shifted to coal and nuclear power. Continuing debate over environmental, siting and safety issues, and financial problems in the utility industry, have introduced significant uncertainties into the outlook for electricity growth.

NUCLEAR POWER

Although nuclear power has the lowest variable operating costs and is insensitive to oil price fluctuations, nuclear plants require the largest capital investment and the longest construction lead-time of any type of electric generating plant. Since June 1974, orders for more than 100,000 megawatts of planned nuclear capacity have been cancelled or postponed--70 percent of planned additions.

COAL

In the late 1960's and early 1970's, state and local air pollution regulations discouraged the burning of coal in many situations. The uncertainty about environmental issues is still affecting the growth in coal use.

FUTURE ENVIRONMENT WITHOUT THE PROJECT

A description of the future environment of the area without the proposed transportation system is based upon several assumptions: (1) economic life of the project would be at least 25 years; (2) present trends in land use would continue; and (3) the existing portions of the pipeline route would continue in use as product transportation conduits.

Should the proposed SOHIO crude oil transportation system not be constructed, current environmental trends would be expected to continue. However, with or without the proposed SOHIO project, the Trans-Alaska Pipeline will continue to function and the projected flow of Prudhoe crude oil through the Port of Valdez for tanker loading and transshipment to market will exist. Environmental trends will change at the Port of Valdez as soon as crude oil goes through the Valdez loading terminal for on-load into tankers. Such action will occur independent of the SOHIO proposal under assessment in this document.

The Port of Long Beach Proposed General Plan, now under consideration, calls for major new port developments.

New crude oil facilities are included in these plans, with or without the SOHIO proposal.

If the Proposed General Plan were adopted, both abiotic and biotic factors in the harbor would be significantly changed from present conditions. The extent of difference between the present and future environmental setting within the Port area would depend upon the amount of dredging, filling, and circulation reduction created by any development undertaken.

Because the crude oil pipeline proposed by SOHIO is a transportation system only, no increased availability of petroleum products along the pipeline route would be expected. Therefore, current trends in oil consumption along the route would probably continue.

Traditional sources of natural gas supply to Southern California from the Permian Basin of West Texas are declining more rapidly than anticipated and new avenues are being pursued to supplement these historic supplies. Midland, Texas, is the economic and population center of the Permian Basin. As oil and gas supplies decline in the Basin, economic balances in the local area will have to be shifted to new sources or suffer a decline corresponding to the decline in field production.

Essentially, a major change in future environment without the project would come from continuing normal growth throughout the area due to expected population increase through the year 2000.

CHAPTER III

THE ENVIRONMENTAL IMPACTS OF THE PROPOSED ACTION

This section of the Executive Summary does not attempt to describe the full scope of all probable and possible environmental impacts presented in Chapter III of the full Environmental Statement. Exhibit H (page III-2) presents a summary evaluation of impacts from construction, operation/maintenance, and accidental oil spill in the affected onshore geographic areas of the proposed action.

The impacts described reflect the information available from SOHIO regarding the details of the proposed action. Where planning or design details have not been worked out or finalized, standard operational procedures or most logical assumptions have been the basis for evaluation. The use of standard procedures for impact description and/or evaluation is more evident in consideration of worst case situations; therefore, without specific plans and procedures being finalized, severity of worst case situations increases. When this problem of lack of project detail leads to severe worst case impacts, they are so identified.

Exhibit H

SUMMARY OF ONSHORE ENVIRONMENTAL IMPACTS

POTENTIAL IMPACT MECHANISM BASED ON APPLICANTS PROP. SENSITIVE LOCATIONS		CONST	O & M	SPILL
Port of Long Beach	CALIFORNIA	H	M	H
Dominguez Hills Terminal		L	L	L
Los Angeles River - Rio Hondo		M	L	L
Los Angeles River Crossing		L	L	H
San Gabriel River - Whittier Narrows Dam		M	M	H
San Jose Creek		M	M	H
Diamond Bar - Puente Hills		L	L	L
Chino - Jurrupa Mts Agricultural Areas		M	L	L
Santa Ana River Crossing		L	L	M
San Jacinto Fault System		-	-	M
Redlands Pump Station		L	L	L
San Timoteo Canyon		L	L	M
San Gorgonio Pass - Whitewater River		-	L	L
Coachella Valley		-	L	L
Indio Pump Station		M	L	L
San Andreas Fault System		-	-	M
Desert Center		H	H	L
Ford Dry Lake Area		H	L	M
Palo Verde Valley		M	L	H
Colorado River		H	L	H
Backwater Lakes-Cibola-Imperial Wildlife Ref.		L	L	H
Ehrenberg Pump Station	ARIZONA	H	M	L
Dome Rock Mountains		H	M	H
Livingston Pump Station		M	L	L
Kofa Game Reserve		M	M	M
Gila Pump Station		L	-	L
Gila River Crossing		-	L	H
Casa Grande Valley Agricultural Area		-	L	H
Picacho Reservoir Area		-	L	L
Coolidge Pump Station		M	L	L
Black Mountain Pump Station		M	L	L
San Pedro River Crossing		-	L	H
Reddington Pump Station		L	L	L
Willcox - San Simon Valley		-	L	H
Burro Cienega	NEW MEXICO	-	L	M
Lordsburg Pump Station		L	L	L
Rio Grande Crossing		-	L	H
Anthony Pump Station		L	L	L
Anthony Sand Dunes		-	L	L
Pecos River Crossing		M	L	H
Pecos Pump Station		H	M	L
Hueco Tanks Co. Park	TEXAS	M	L	L
Guadalupe Pump Station		M	L	L
Red Bluff Reservoir		M	L	H
Sand Dunes		M	L	L
Ector County Oil Field		M	L	L
Midland Water Quality		H	L	L

KEY: H = High/Significant Impact M = Moderate Impact
L = Low/Insignificant Impact - = No Impact

The findings of the analysis team indicate that three categories of environmental impacts which would be created by the proposed action appear to be more critical than others also identified. First is the impact upon air quality; second is possible hazard from accidental oil spills; third is aesthetic impact of new transmission lines across stretches of relatively undisturbed desert country.

AIR QUALITY

Exhibit I (page III-5) presents a specialized evaluation of air quality impacts as to cause, location, project life, significance, potential impacts, mitigating measures, and unavoidable impacts.

Port of Valdez -- The Final Environmental Impact Statement for the Trans-Alaska Pipeline (1972) evaluated air quality impacts of Alaskan port facilities, but did not quantify those impacts due to loading crude oil in tankers. It should be noted, however, that crude oil loading at the new Valdez Marine Terminal will occur with or without the SOHIO project, and impacts created by such loading cannot be assigned to the applicant's proposal. The flow of crude oil through the TAPS line, the onloading to tankers for marine transshipment, and the delivery of that oil to offloading ports for distribution to market are axioms which will occur with or without the approval and initiation of the proposed SOHIO project. Alyeska Pipeline Service Company collected baseline air quality and meteorological data in the Valdez basin. BLM directed its contractor, Environmental Research and Technology, Inc., to analyze the Alyeska data in light of projected emissions from tanker fleets with and without the SOHIO project. Copies of this analysis are available for review at the BLM State Office in Sacramento, California.

The ERT study assumed tankers onloading 1,200,000 barrels per day from the TAPS line at the Valdez terminal, regardless of the final outcome of the SOHIO project. Computer simulations indicated that there would be significant oxidant air quality impact with any fleet configuration. The analysis, however, did not clearly distinguish differences in impacts with or without project approval. Approval of the SOHIO project would provide more tankers with segregated ballast for the Alaska trade, but no clear advantages or disadvantages could be positively identified in the study. This problem can occur with or without approval of the SOHIO project.

Some caveats about the accuracy of the modeling are in order. There have been few instances where

EXHIBIT I

AIR QUALITY IMPACTS EVALUATION

CAUSE	LOCATION	PROJECT LIFE	SIGNIFICANCE (L-M-H-VH)	POTENTIAL IMPACTS	MITIGATING MEASURES	UNAVOIDABLE IMPACTS
HC & NOx during construction from use of equipment	Local to site construction	Probability high, but short duration	M	Very small on total oxidant.	None	Same as potential pacts
Dust during construct. from equip.	Local site construc. at all sites	Probability high, but short duration	L - H	Calif. and national standards could be exceeded	Watering dust cont.	Reduced impact of unknown degree
SO_2 during operation (tankers)	Long Beach	Probability high, few times	L - M	Violation of Cal. 24/hr std. near Pier J	All ships burning 0.5% sulfur fuel in port	Very low probability of exceeding standards
Particul. during ops. (tankers)	Long Beach	Probability low, few times	L	Violation of Cal. 24/hr TSP std.	All ships burning 0.5% sulfur fuel in port	Modest reduc. could mean lower violations
Oxidant (NOx & HC) in tanker BALLASTING during operations	Los Angeles	Probability several times annually exceeding Fed. stds.	M - H	About 25% incr. in oxid. level if non-segreg. ballasting.	Only tankers with inert gas & segreg. bal. systems allwd in port. Monitoring in port reqd.	Storage tanks could increase oxid. levels 1% at most. Add'l viol. unlikely.
Oxidants during PURGING operations	Los Angeles	Unknown	L - H	Up to 15% incr. in oxid. levels onshore	Monitoring in port. Ops manual prohibits.	Reduced impact of unknown degree
Oil spill accidents (tanker or pipeline)	Anywhere	At least once in land or water locations	L - VH	Major spill can violate stds, or result in record oxid. levels	Oil spill cont. plans; full skirting in port	Impact reduced, but not removed

computer models have been specifically adapted to treat reactive point sources such as those associated with the SOHIO proposal, and little effort at validation to date has been expended.

In summary, the results of the ERT study are suggestive only. Air quality in future years with or without the proposed SOHIO project cannot be predicted on the basis of studies provided for this document. No incremental change can be specified at this time.

Los Angeles Basin Air Quality Impact -- Environmental impacts on air resources in this area result from a variety of sources such as tankers, storage tanks, and construction of new facilities. Different pollutants are involved and include dust, hydrocarbons, oxidants, sulfur dioxide (SO2), and nitrogen oxides (NOx). Present ambient air quality in Los Angeles is worse than specified in state and Federal standards on most days. The project proposal, as well as the proposed operating procedures for tankers within the port area, would prevent: (1) ballasting into emptied petroleum cargo tanks on tankers without sufficient segregated ballast; or, (2) gas-freeing empty cargo tanks on inerted tankers while in port or coastal waters. Since the tanker fleet is configurated for both segregated ballast and inerting systems, impact in the basin would be less than if ballasting and gas-freeing operations were to be expected as a day-to-day occurrence. These problems aside, the applicant would need to acquire other emission sources and, by shutting them down, use them as "trade-offs" for new project oriented emissions. The net result, assuming that "trade-offs" are made, would be that the proposed action would contribute, by a fairly small increment, to an air quality situation that does not meet current standards without the proposed project. Most of this incremental impact would occur during just over one year of construction.

ACCIDENTAL OIL SPILL IMPACT

The impacts from an oil spill and the created hazards would impact all aspects of the environment affected by the spill. Nearly every resource category of the Statement discusses the damages that would occur from an oil spill. Several types of accidents could result in major impacts. The two most serious would be tanker accidents that could result in oil coming ashore on beach areas; and, a major pipeline rupture in a stream, such as the Colorado River, or in an earthquake fault zone. Less well-known, but perhaps a greater possibility, would be impacts from small leaks in the pipeline that could go undetected for days or weeks. Another hazard which must be considered is the possibility of small spills from normal operations in the Port of Valdez loading and in the Port of Long Beach berthing, off-loading, and transfer areas.

Not all tanker accidents lead to oil spills and variability is large. The nationwide tanker accident rate is about 4.4 per 1,000 trips; in port areas about 2.65 per 1,000 trips. The Port of Long Beach has a very low accident rate, the significant factor probably being the local vessel traffic system which operates two radars and has bridge-to-bridge, as well as bridge-to-port radio communications. A traffic separation system is used in the Santa Barbara Channel along the marine route, and a vessel traffic system is presently under construction for Prince William Sound and Valdez, Alaska, which would probably reduce accident rates in that area.

More than 90 percent of experienced oil spills are smaller than 1,000 gallons (about 25 barrels) and more than 50 percent are smaller than 15 gallons (one-third of a barrel). Accidents at sea contribute a larger share of spillage than harbor accidents, which result in relatively smaller amounts.

Most oil spills are the result of operational spills rather than tanker accidents or losses. While much rarer, tanker accidents do result in much larger amounts of oil being spilled. A study prepared for BLM by ERT, Inc., indicates the probability that the chances of a total tanker loss within the 25-year life of the project would be 0.56, or once in 85 years.

If total tanker loss does not occur during project-lifetime, the probable annual volume of spill is estimated to be: 389 barrels in Prince William Sound; 302 barrels in coastal waters between San Francisco and San Pedro Bays; and, 130 barrels in San Pedro Bay.

Estimates predict about 23 operational spills per year, at the rate of about 7 barrels per spill, distributed equally between both port areas and the open sea. This type of spill usually occurs in a terminal area; some as the result of equipment failure, but mostly due to personnel failure which could be eliminated or reduced by better training, adequate supervision, and improved vigilance.

Present numbers of icebergs which have been observed drifting from Columbia Clacier into the shipping lanes of Valdez Arm do not generally appear to represent a significant hazard for tanker collision.

There is some evidence to indicate that Columbia Glacier may be entering an unstable condition (retreating).

Should this occur, an increase in icebergs could be expected and the probability of collision would increase dramatically, if no precautions were applied.

Several factors would affect the impacts of iceberg-tanker collisions. Not all, and perhaps very few, collisions would result in tanker damage and spills. Size of potential icebergs and their potential for damaging tankers is not known. In addition, the potential navigational controls such as iceberg warnings, towing of icebergs out of the lanes, or the temporary shutdown of traffic would reduce collision probability. Double hulls or reinforced bows on the tankers might also be a significant factor in reducing oil spill potential should collisions occur.

Statistical data indicate that the probability of a pipeline rupture and large spill along the route is small. Under natural forces, pipelines tend to bend without breaking. Pipeline spills can be placed into three categories: (1) those too small for detection by monitoring systems; (2) those that come from leakage rather than rupture, but are large enough to be detected by the system; and (3) those that occur as a result of pipeline rupture.

The leaks too small for detection would release oil indefinitely and could only be detected by degradation of ground water. The spills from detectable leakage are assumed to range between 500 and 3,000 barrels. Spills resulting from ruptures are mathematically assumed to exceed a total of 3,000 barrels. According to national statistics, however, the average pipeline spill would be in the range of 800 to 1,500 barrels. In view of the very small size of most spills, an average figure is of little significance.

NEW TRANSMISSION LINES IN DESERT AREAS

The construction of new transmission lines across stretches of relatively undisturbed desert country to supply power to pump stations would directly impact the visual quality of the present environment. In some areas where lines are proposed, no overhead lines presently exist. Eight of the pump stations would require at least 10 miles of powerline to serve them as the project is currently proposed. Two of the pump stations would require 30 miles each in new powerline construction.

ADDITIONAL IMPACTS

In addition to the three broad impacts presented above are several other impacts affecting the environment.

The six storage tanks proposed for location at Pier J would detract from the present aesthetics of the Long Beach Harbor, and might be in conflict with the goals of the California Coastal Plan.

Serious wildlife impacts are possible in certain areas if due care is not taken in construction, operation, and maintenance of the proposed project. All eight of the Federally-classified endangered species of whales (fin, humpback, sei, sperm, blue, gray, right, and bowhead), as well as the Federally-classified endangered American peregrine falcon, short-tailed albatross, Aleutian Canada goose, light-footed clapper rail, California least tern, and Belding's Savannah sparrow, could potentially be affected by oil pollution along the tanker route and in the ports of Valdez and Long Beach. Oil spills during the nesting season could adversely affect reproductive success, as well as feeding habitats. The California sea otter was added to the Federal Threatened Species list in January, 1977.

Species classified by the State of California as rare, and which could be adversely affected by oil pollution, include the California black rail, the Guadalupe fur seal, and the island fox.

One particular note of serious concern is the possible impact on Desert Bighorn Sheep habitat in the Dome Rock Mountains of western Arizona. Three fish (Colorado squawfish, humpback sucker, and bonytail chub) and three birds (Yuma clapper rail, California black rail, and yellow-billed cuckoo) that are presently on the threatened or endangered species list could be affected by the Colorado River pipeline crossing, as could the similarly threatened rosy boa in the Dome Rock Mountains. Should a large oil spill occur in marshes and streams along the pipeline route, the impact on wildlife would be significant. Both Picacho Reservoir and Willcox Playa in Arizona are representative of areas that could be impacted by such a spill.

Additional impacts would include loss of soil productivity through compaction, contamination, and failure to segregate top soil in cultivated areas.

Spills of oil or water used for hydrostatic testing could result in major impacts on soil.

Vegetation along the route would be affected by construction in that natural grass areas would be destroyed. Additionally, any oil spill could endanger, and might destroy, some rare plants.

No impacts to ground water or surface water are expected from the hydrostatic testing of the pipeline prior to operation; i.e., based on the proposed water source, disposal sites, and testing and treatment procedures presented in the applicant's hydrostatic test plan.

However, water quality would be adversely affected by an oil spill. Also, some sedimentation would occur downstream from construction at stream crossings. The Colorado and Pecos Rivers are subject to the greatest threats from sedimentation.

The reader is encouraged to examine Exhibit H (page III-2) for an evaluation of significant, moderate, and insignificant impacts in various areas. This Exhibit is a summarization of onshore impacts in all resource areas.

CHAPTER IV

MITIGATING MEASURES

Mitigating measures are actions taken during project construction, operation, and maintenance which would either eliminate or significantly reduce adverse environmental impacts caused by implementation of the proposed action. Many standard operating procedures or project design features would, in themselves, reduce or eliminate potential adverse impacts.

This chapter divides mitigating measures into three categories: (1) those to which the applicant is committed by the original proposal, or by additions and changes thereafter; (2) those which responsible enforcement agencies have said would be enforced, and which commit the applicant; and, (3) those measures which had not been committed by either the applicant or a responsible agency at the time of publication of this Statement but which, however, may be stipulated prior to issuance of contracts or permits. All measures that will be required of the applicant are not listed herein. Many agencies work directly with an applicant on specific jurisdictional mitigations.

The following summary of mitigating measures includes those which were amplified, made site-specific when and where possible, and which are fully documented in Chapter 4 of the full Environmental Statement, along with the anticipated effectiveness of each measure.

APPLICANT COMMITTED MEASURES

'These mitigating measures were compiled from the applicant's proposal (see Chapter 1), from subsequent answers to questions requesting clarification of specific items, and from the applicant-proposed trade-off measures submitted to the South Coast Air Quality Management District in Southern California.

1. Saltwater ballast contaminated with oil will be pumped from tankers to water treatment facilities at the Port of Valdez, where oil will be separated and the remaining water treated to produce an effluent that will comply with EPA standards.
2. SOHIO ships will burn 0.5 percent or less sulfur content bunker fuel for off-loading crude oil and while in port.
3. Purging in San Pedro Bay will take place only in emergency situations.
4. Preparation of an oil spill contingency plan for the port terminal and pipeline route before issuance of permits.

5. Proposed West Coast sale through Pier J of 200,000 barrels per day of Alaskan crude oil for local use in order to back out an equal amount of foreign import oil currently being introduced into the area under conditions creating greater air pollution than would occur under the SOHIO proposal.
6. Reduce hydrocarbon emissions at three dry cleaner plants in the Los Angeles Air Shed by modifying the present process and installing additional air pollution control equipment on existing processes.
7. Install catalyzed ammonia injection on 33 natural gas-fired internal combustion engines which drive compressors in the Los Angeles Air Shed.
8. Reduce particulate emissions of 200 lbs/day in the Los Angeles Air Shed by paving streets, lots, or otherwise reducing fugitive particulate emissions.
9. Conduct detailed geotechnic investigations in the vicinity of active and/or suspected faults, and location of structural facilities outside the San Jacinto and San Andreas fault systems.

10. Locating pipe aboveground in the vicinity of high-risk soils.
11. Valves will be located on each side of the San Andreas fault zone, and the pipeline will cross seismic faults at angles between 70 and 90 degrees where possible.
12. Use of best available system for detection of small subsurface oil leaks.
13. Where possible, bedrock excavation will be ripped with heavy equipment. When blasting is required, charges will be designed to confine the excavated material within the right-of-way.
14. Blasted rock, if appropriate in size and composition, will be used as trench backfill, as aggregate, or for erosion control.
15. Water crossings will be made at periods of low flow or no flow.
16. Construction through high fire-hazard areas (San Timoteo Canyon, San Gorgonio Pass) will be scheduled, where possible, during periods of low fire hazard. Fire safety precautions will be strictly enforced.
17. Archaeological surveys will be conducted prior to construction of new pump stations and power line adjoinments.

18. Provision of appropriate noise suppression devices for pumps, vehicles, and construction equipment.

19. Removal of abandoned gas compressor concrete pads and restoration of the ground to its original condition.

20. Avoidance of environmentally sensitive areas such as critical wildlife habitats in siting pump stations and maintenance bases.

21. Double trenching in cultivated areas to maintain top-soil fertility.

22. Landscape pump station locations.

MEASURES REQUIRED BY FEDERAL, STATE, LOCAL AGENCIES AND OTHER ENTITIES

Federal, state, and local government agencies having jurisdiction in all areas of impact must issue permits and/or certificates to allow implementation of the proposed project. These governmental entities are obligated to institute regulations and specific contractual requirements to specify stipulations intended to reduce environmental impacts.

The full listing of required measures not included in the proposed action can be found in Chapter 4 of the full Environmental Statement. Adjacent to each mitigating measure is a discussion of anticipated effectiveness, and a list of Federal, state, and/or local agencies having jurisdiction.

1. Develop Traffic Separation Schemes along the marine route and a Channel Vessel Traffic Service prescribing behavior of vessels in the Prince William Sound approaches to the Port of Valdez.
2. Vessels navigating Prince William Sound and the Valdez harbor will be equipped with LORAN-C, collision avoidance system, and two radars.
3. Tankers of 40,000 DWT or more in Prince William Sound or the Valdez Harbor must be escorted by tug unless exempted by the State of Alaska.
4. In Alaskan waters the amount of financial responsibility for each carrier shall not be less than $20 million or an amount required under applicable Federal law or regulations; for each facility, not less than $1 million.
5. Any salmon streams from which stock is depleted due to the adverse effects of an oil spill will be restocked.

6. SOHIO ships will burn 0.5 percent or less sulfur content bunker fuel for offloading crude oil south of Point Mugu.

7. Trained inspectors will perform complete monitoring, from the time the tanker enters the Port of Long Beach until it departs.

8. Only tankers having fully segregated ballast will be permitted to utilize the proposed Pier J berthing facilities.

9. Only tankers having inert gas or equivalent systems will be permitted to use the proposed berthing facilities.

10. Unloading operations will not begin until such time as the vessel or the terminal berth enclosure is fully boomed as a preventative measure against potential oil spills.

11. An air pollution monitoring station will be established in the Port of Long Beach area to aid in measuring ambient concentrations of air pollutants from the Port and general area.

12. Dredging operations will be conducted during the time of year that will minimize the impact on the marine biota.

13. The breakwater, as proposed, is considered permeable above -10 feet mean lower low water (MLLW). If the breakwater is not made impermeable, a permanent boom will be placed under the entire trestle to prevent oil from escaping.

14. Public access to the shoreline fishing area on the southeast corner of Pier J will not be curtailed.

15. In all pipeline sections from Pier J to Redlands, watering will be required during construction to minimize dust emissions.

16. Riparian sites in the San Gabriel River channel will be avoided to conserve wildlife habitat.

17. The pipeline will be buried at a sufficient depth to prevent its being exposed by scouring action during infrequent flood flows in the San Gabriel and Santa Ana rivers.

18. Construction in the San Timoteo Canyon will be scheduled during periods of low fire potential, and strict fire precautions observed.

19. Chuckwalla Valley dune-thicket near Ford Dry Lake will be avoided because of its high wildlife values.

20. Streamside vegetation at the Colorado River crossing will be restored immediately after construction to prevent bank erosion. Indigenous riparian plant species will be used.

21. Emergency oil spill contingency equipment will be permanently maintained at a Colorado River site acceptable to U.S. Fish and Wildlife Service.

22. The Ehrenberg Pump Station site in Arizona will be relocated approximately 0.75 mile east on the existing pipeline right-of-way to a point opposite the Interstate 10 interchange and the truck refueling stop.

23. The microwave tower at the Ehrenberg Pump Station will be reduced in height from 250 to 60 feet.

24. Alternatives to the proposed powerline extension over the Dome Rock Mountains will be studied to minimize impacts on desert bighorn sheep, scenic and open-space values.

25. Use of explosives near the Kofa Game Range will be limited to the June-October period to minimize disruption of deer and sheep during the fawning and lambing periods and to minimize conflict with hunting seasons.

26. The use of landscaped berms around pump stations and the painting of valves, pipes, buildings, and fences with nonglossy desert colors will be required to minimize visual impacts.

27. Chemical analysis of hydrostatic test water will be made to determine treatment needed, and disposal will conform to state or local discharge requirements.

28. The applicant's oil spill contingency plan will be submitted to and approved by the Environmental Protection Agency and appropriate state authorities prior to permit issuance.

29. A field search will be made for Threatened or Endangered plants and animals in the California Colorado Desert by Bureau of Land Management personnel after the center line right-of-way description is available and prior to issuance of permit for construction.

30. The sand dunes in Winkler County will be surveyed for the Threatened plant *Proboscidea sabulosa*, and efforts taken to protect the species encountered.

31. All practical measures will be taken to eliminate or reduce needless loss or damage to archaeological, paleontological, and historic values resulting from the proposed action.

32. Stipulations and permits issued prior to any new construction will require that the U.S. Fish and Wildlife Service and the appropriate state fish and game departments determine if any critical habitat will be impacted and recommend any mitigating measures necessary to comply with the Endangered Species Act of 1973.

PROPOSED MITIGATING MEASURES

The following mitigating measures had not been committed to by the applicant or a responsible enforcement agency at the time of this writing. These measures have been proposed by analysts and commenters, and some may be included in permits or contracts as stipulations. For purposes of this document, however, it has been assumed that these measures are not now, and may never be, committed.

1. Landscape design should be provided by the applicant prior to permit approval to make the offloading facility an enhancement of Pier J in accordance with the California Coastal Plan Guideline No. 52.
2. The number of storage tanks on Pier J should be reduced to the number needed to accommodate the surge of three 165,000 DWT tankers off-loading simultaneously with the 48-inch pipeline to Dominguez Hills pumping at capacity. Storage tanks constituting inventory should be removed from Pier J to the Dominguez Hills inland terminal site.
3. A plan for mining and reclamation of the Santa Catalina Island Rock Quarry should be submitted and approved before a permit for any expansion of the quarry is granted.
4. Foundations, equipment, and facilities at the Dominguez Hills site should be designed to withstand a 7.5 magnitude earthquake on the Newport-Inglewood fault.
5. The Threatened plant species Opuntia arenaria occurs on sand dunes at Anthony, New Mexico. If, after survey, this species

is found in the area, a biological opinion should be obtained from U.S. Fish and Wildlife Service as to the sensitivity or critical nature of the site.

6. The El Paso Pump Station site should be relocated one mile west on the existing pipeline right-of-way to remove the pump station and powerline extension from the foreground visibility zone of Hueco Tanks State Park.

CHAPTER V

ADVERSE IMPACTS WHICH CANNOT BE AVOIDED

This chapter discusses previously described adverse impacts that may still exist after the application of the applicant and agency committed mitigating measures. Criteria for "unavoidable impacts" were based on the assumptions that: (1) Some adverse impacts would remain after the committed mitigating measures in Chapter 4 are implemented; (2) a mitigation may not be completely successful or compliance may not occur; and (3) some impacts cannot be mitigated, or no commitment has been made for mitigation. Those proposed measures listed in Chapter 4 which had not been committed at this writing were not considered in assessing unavoidable impacts.

ACCIDENTAL OIL SPILLS

One of the most significant unavoidable impacts would be an oil spill: either the irregular major occurrence at sea or in port; recurring operational spills at the Port of Long Beach; or, a pipeline rupture or slow leak.

Yearly probable volumes of accidental oil spill are determined by the rare events where the vessel is a total loss. Such an event is estimated to have a

0.56 percent probability during the lifetime of the project; i.e., total loss of a tanker resulting in a major spill of up to 1.2 million barrels of oil is predicted to occur once in 85 years.

If the assumption of total vessel loss is eliminated from the mathematical projections, statistical probability of annual oil spill volume drops to 1,260 barrels, distributed as follows: Prince William Sound, 389 barrels; open ocean between the Sound and San Francisco Bay, 439 barrels; coastal waters from San Francisco to San Pedro Bay, 302 barrels; and, within San Pedro Bay, 130 barrels.

The probable rate of operational spills in the harbor areas covered by the proposed project is estimated to be approximately 9 spills per year, at 7.2 barrels per spill, at both the Port of Valdez and the Port of Long Beach. The actual rate for the SOHIO tanker fleet is expected to be lower because of new pollution prevention regulations and terminal design at Valdez.

Losses of marine and estuarine wildlife and vegetative species, as a result of oil spill damage, could be significant depending on the concentration of oil, the time of year, and response to a spill or leak. Oil spills would also have an unavoidable impact on recreational use of both open water and beach areas for the time required to effect cleanup.

Available information indicates that accidental and operational discharge of oil would occur in spite of full utilization of technological advances and stringent regulations. Thus, there would be a gradual buildup and accumulation of pollutant hydrocarbons during the life of the project in the marine environment. Worst conditions of wind, waves, visibility, precipitation, darkness, and temperatures are often present at the time of an oil spill as a causative factor of the accident, and they also inhibit cleanup efforts.

A major unavoidable impact would be a tank or pipeline oil spill resulting from natural causes, such as earthquake, with particularly severe potential effects where ecosystems would be contaminated. There is a 50 percent chance that the California portion of the project would be subjected to an earthquake of magnitude 7.0 or greater during its 25-year designed life. Damage from strong shaking would probably occur to various ancillary facilities, rather than to the pipeline itself, and oil leakage from these damaged facilities would be the direct cause of an unavoidable impact.

Loss of about 100 acres of benthic habitat would be unavoidable at the Port of Long Beach as a result of dredging and breakwater construction. Water turbidity levels due to Pier J construction would be high during dredging, but of short duration. Construction impacts on water at other locations have been partially mitigated. Not entirely avoidable are the impacts on water turbidity levels in excess of state standards, as well as disruption of riparian and endemic biological communities.

Unavoidable impacts on surface waters would occur at all stream crossing/construction sites adjacent to live streams or bodies of water, temporarily interfering with recreational activities and biologic communities.

Unavoidable impacts to urban areas are primarily associated with the conversion/construction phase of the project when ambient noise levels would be increased.

The greatest unavoidable impacts to nonurban areas would be disruption of presently undisturbed natural open spaces for the width of the right-of-way along the proposed pipeline alignment and the sites of ancillary structures. Approximately 1,700 acres of natural vegetation within the work areas would be forfeited, eliminating some wildlife habitats and diminishing natural erosion protection. Destruction of individual, undetected, Rare or Endangered plants that exist within the construction corridor could occur, even with a mitigating measure designed to fully protect individual species.

During project operation, maintenance activities would necessitate access roads, preventing revegetation for the life of the project.

Routine operation and maintenance of the proposed pipeline would create long-term continuous, but minor, unavoidable effects on wildlife because of noise and human activity associated with normal operation and maintenance procedures. A secondary long-term impact to wildlife would be the increased off-road vehicle use on the new access and maintenance roads which would, if frequent, destroy vegetation in the areas used and thus affect resident wildlife populations by reduction of food and cover and by disturbance. Even installing gates on access roads, it is virtually impossible to eliminate public access once the roads are built.

Another unavoidable impact of the access roads traffic would be the permanent compaction of the soil. Providing a path for erosive velocities of runoff would be an impact additional to the loss of vegetation.

Unavoidable visual impacts upon several recreation and open-space areas would be caused by project support structures against the skyline. The tank farm on Pier J, Port of Long Beach, apparently conflicts with California Coastal Plan visual guidelines which state that industrial facilities not coastally dependent, including tank farms, be located inland. Although mitigation has been proposed to relocate the Pier J storage tanks to an inland site, it might be necessary to locate two or more surge tanks on Pier J for off-loading purposes. Along the pipeline route, unavoidable adverse visual impacts would result from powerlines at several locations, unless presently proposed, but uncommitted, mitigation measures are applied (see Chapter 4 of the full Environmental Statement).

AIR QUALITY

Once the TAPS pipeline and the Valdez marine terminal are operational, a deterioration of air quality in Port Valdez can be expected from elevated levels of oxidant and sulfur dioxide. Frequent occurrences of a low inversion lid could result in air quality impacts due to trapping effects. The TAPS pipeline and terminal, however, will occur with or without the SOHIO project, and changes in air quality resulting from their operation are not unavoidable impacts that can be exclusively assigned to SOHIO.

Within the Los Angeles Air Shed, emissions from tanker exhaust nitrogen oxide would be fully diluted before oxidation to NO2 and, even then, would not violate California one-hour standards. The California total particulate standard would probably be violated only a few times during the life of the project from tanker stack emissions. Oxidant levels could more than double if any tanker purged cargo tanks under adverse meteorological conditions while in the coastal air shed; however, only tankers with inert gas or equivalent systems would use the Long Beach terminal.

The lighter fractions of spilled crude oil evaporate rapidly; consequently, oxidant levels can measurably increase downwind from major spills (200 or more barrels). The precise impacts depend sensitively on meteorological conditions and location of the spill. A spill of at least 200 barrels under severe weather conditions, or a larger one under milder conditions, would probably occur at least once along the marine route during the 25-year life of the project.

As long as voluntary commitments and lease stipulations for Pier J operations are actualized, violations of hydrocarbon and oxidant standards should only be contingent upon emissions from storage tanks. Emissions from hydrocarbons in exhaust gases from tanker stacks would be minimal. However, minor unavoidable emissions from small scale oil spillage and from tanker stack gases could be expected.

Since several standards are frequently exceeded in the Los Angeles Air Shed, smaller increments of other air pollutants may contribute to additional violation of standards in immediate proximity to construction. Rigorous application of dust control watering can effectively reduce ambient particulate levels.

Prior to approval of the project, it is expected that the applicant will have obtained acceptable emission trade-offs on a more than one-for-one basis. The project, as approved, can then be expected to result in insignificant adverse, or even beneficial, impacts on air quality from normal operations. The only remaining impacts would then be in the immediate vicinity of Pier J and storage tanks. Seldom would a standard be violated in a populated area, such as near the Queen Mary or along the beach.

CHAPTER VI

SHORT-TERM USES AND LONG-TERM PRODUCTIVITY

This chapter addresses the relationship between short-term uses of the environment for the proposed project and long-term effects upon environmental productivity resulting from implementation of the proposed project. For purposes of this analysis, short-terms are defined as those occurring over the economic life of the proposed project, estimated to be 25 to 35 years. Long term productivity covers the time period after the economic life, or abandonment, of the proposed project.

Within the "short-term" time frame would be some immediate construction activities which would temporarily disrupt the environment and current use of short segments of the area traversed by the project. Following construction, the operational phase would permit the majority of the construction corridor along the pipeline route to revert to previous use. Operational use of the environment over the 25 to 35 year "long-term" period primarily involves the Valdez and Long Beach port facilities, the inland terminal storage facilities, pump stations, pipeline maintenance roads, power transmission line roads, microwave communication facilities, and the Midland terminal storage facilities.

MARINE ROUTE

Marine environments along the tanker route would not be enhanced and, even with the best of mitigating procedures, would be adversely affected by an oil spill, particularly on the short term when biological productivity would suffer in the affected areas. As quantified in Chapters III and V of this document and the full Environmental Statement, worst case oil spill during the short-term (life of the project) would be a total tanker loss, with a 0.56 predictability.

Because the long-term effects of incremental and major spillage of oil cannot be accurately projected, and occurrence of incremental and catastrophic project-related oil spill is not known, the project's specific relationship between short-term use and long-term productivity with respect to the marine communities cannot be quantified.

PORT OF LONG BEACH

A catastrophic, project-related oil spill in the harbor area could create severe impacts. Water quality, sediments, and biological communities would certainly be impacted on the short-term. While the long-term effects cannot be thoroughly quantified, it can be stated that the project would possibly create a threat from potential oil spills that could reduce the long-term productivity of the biological marine communities and populations within the harbor complex.

Project construction elements such as the breakwater and trestle would offer new long-term habitat for the colonization of rocky shore species, piling organisms, and associated fish and birds. However, installation of the permanent breakwater would also result in a long-term loss of 5.9 acres of surface water in the harbor and 22 acres of benthic habitat.

AIR QUALITY

At the Port of Long Beach marine terminal, small short-term degradation of air quality near construction would be expected. During operation, adverse impacts on air quality would vary with meteorological conditions and tanker off-loading events. A major spill in the Port area would probably not occur during the lifetime of the project but, if it did, the impacts upon air quality would be severe under almost any meteorological conditions.

Along the pipeline route, no significant short-term impacts on air quality are expected after construction is completed. During construction, fugitive dust and nitrogen oxide emissions (NOx) may affect visibility during gusts and high wind as well as the possibility of, on occasion, lowering the performance of workers.

No impacts on long-term productivity of the air sheds are expected after completion of the project.

NOISE

Noticeable noise levels would be experienced by sensitive receptors for a short time during construction. During the life of the project, noise might be noticeable near a few pump stations at night when ambient noise levels are lower. Maintenance activities could create occasional objectionable noise.

GEOLOGY

The short-term loss of geologic resources that would be unavailable for extraction and consumption during the life of the project are those that directly underlie and support the right-of-way, such as sand and gravel deposits. Those geologic resources situated at depth beneath the right-of-way probably would not be affected since they could be extracted by wells whose surface operations may be remotely located from the right-of-way area.

No long-term loss of geologic or mineral productivity is expected.

SOIL

Short-term soil movement would be undetectable from that of normal geologic erosion if the year of construction is meteorologically normal.

There would be an indeterminate reduction in crop yield for two to three years following construction because of the variables of indiscriminate soil profile mixing and rooting depths and growth habits of individual crops.

Long-term loss of soil quality would be evident on open space lands from soil profile mixing during construction and compaction during operation.

WATER

Measurable short-term water losses and water quality degradation resulting from hydrostatic testing, dust abatement, new pipeline burial at various river crossings, and possible pipeline leaks are predicted. However, such impacts are generally not expected to affect the long-term productivity of water resources.

In the event of major pipeline rupture, or an undetected small leak over an extended period, productivity of some waters for industrial, domestic, recreational or other purposes could be forfeited for days to months, depending upon the magnitude of the spill and its specific location.

VEGETATION

In the California grassland, there would be a short-term loss of productivity in the area not affected by soil profile mixing. There would be no significant forage for grazing the first two years after construction. The loss of annual grass productivity would be for at least a 10-year period as a result of loss in plant density and vigor where soil profile mixing occurs.

Within the Colorado and Yuman Deserts, where annual rainfall averages five inches or less, the impact on vegetation would be of a long-term nature. Productivity at the pump stations would be lost for many years beyond the life of the project.

Following power transmission line construction, there would be long-term impacts upon vegetation productivity, including permanent devegetation of the maintenance roads, a slight increase in plant cover under the central wire, and a somewhat greater vegetation enhancement along the road edge.

In the region that includes the Desert Grassland Biome to about Jal, New Mexico, the pipeline would cross predominantly semi-desert shrug-grass ranges that receive an annual precipitation of 8 to 14 inches a year. With increased precipitation, recovery time should be less than in the Mojave Desert. Revegetation by seeding is unreliable when annual precipitation is less than 12 or 13 inches.

Revegetation time, and consequently long-term productivity along the entire pipeline, is dependent upon a number of variables: amount of annual and seasonal rainfall, soil quality, magnitude of soil disturbance, vegetation remaining within the construction zone, as well as the age of the plant community adjacent to the pipeline corridor.

WILDLIFE

The most obvious short-term impacts from the proposed project would be from an accidental oil spill which, if it occurred in one of the major rivers crossed by the pipeline, could impact the aquatic ecosystem for at least five years.

Long-term loss of habitat would occur due to the construction of pump stations and powerline maintenance roads. The most significant long-term impacts would be on small game, birds, reptiles, and amphibians Animals displaced from new construction areas would most likely be lost since, normally, there are no "unoccupied" areas for reestablishment.

VISUAL RESOURCES

Construction activity in desert areas represents a long-term visual impact as cleared areas and lighter-colored subsoils are visually evident until revegetation, weathering, and erosion processes restore the landscape's natural character adjacent to the maintenance roads and pump stations.

RECREATION RESOURCES

Short-term impact of construction may briefly disrupt recreation resources. Any accidental oil spill could have a long-term adverse impact on beaches and at the Colorado River. Pipeline and powerline access roads could provide new areas for motorized recreation, possibly affecting long-term productivity of soils and vegetation.

SOCIOECONOMIC PRODUCTIVITY

It is expected that the proposed conversion of El Paso gas lines to crude oil transportation would not affect the long-term productivity of natural gas supplies in the Permian Basin, which are already on a depleting curve.

OPTIONS WHICH MIGHT BE FORECLOSED FOR FUTURE USES

Sea Leg

It appears that no long-term future uses of the marine environment along the tanker route would be significantly foreclosed. However, long-term adverse impacts resulting from oil spill effects on marine organisms are not known. Such future uses as commercial fishing or crab harvesting in Prince William Sound, or kelp harvesting in Southern California, could conceivably be affected by oil spills resulting from the proposed project.

Port of Long Beach and Terminal Area

The potential utilization of this resource could be reduced or possibly foreclosed by project-related incremental and catastrophic oil spills that cause tainting of fish flesh.

The northern anchovy is sought for commercial and bait purposes and its presence is exceptionally important in the Los Angeles-Long Beach harbor complex. The harbor is an important nursery for the anchovy and is immensely important to the fishing industry. This resource could be reduced or possibly foreclosed by project-related environmental changes due to construction and oil spills. Also, the dredged channel area could not be fished as intensively because of the shipping traffic.

Pipeline Route

No options have been identified which would be foreclosed to future uses except as noted in the foregoing sections due to long-term commitment of resources.

CHAPTER VII

IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

This chapter describes the irreversible and irretrievable commitments of both renewable and nonrenewable resources involved in the construction and operation of the project.

Irreversible commitments of resources would result from actions which could not be reversed once the project is initiated. These resources would be committed, or jeopardized, for the life of the project, with revocation of permits, cessation of operations, or removal of structures unlikely. Irretrievable commitments of resources involve those resources which could be consumed, destroyed or degraded during construction and/or operation of the project, including losses due to oil spills through accidents or natural catastrophes.

Irretrievable commitments of biological resources would be limited to plant and/or animal species lost during construction of the project or from chronic or accidental contamination from oil spill in the marine, terrestrial, and fresh water environments. These could occur particularly in Prince William Sound, the Port of Valdez, and the Port of Long Beach, San Pedro Bay, or at sensitive water crossings such as the Colorado River.

Visual intrusion and land-use commitments associated with construction of the project, including its related ancillary facilities, would constitute irreversible resource commitments for the life of the project.

Mineral needs for construction of pipe and tankers will irreversibly commit unknown quantities of steel, and irretrievably commit unknown quantities of sand, gravel, cement, asphalt, and water. Upon abandonment of the project, the steel could be salvaged.

The destruction of any marine life during construction and operation activities would cause irreversible and irretrievable losses; the specific organisms destroyed constitute a resource loss that cannot be restored.

The Long Beach breakwater and trestle pilings would permanently displace about 22 acres of relatively high-species-diversity benthic habitat, constituting an irreversible commitment of habitat and irretrievable destruction of organisms. The breakwater, however, would likely create a new rock fish habitat.

The materials used to construct the eight steel storage tanks and the space occupied by the tank farms would be commited for the life of the project. Upon abandonment of the project, the tank farms could be converted to another use or the materials salvaged and the site used for some other industrial land use.

The pipeline rights-of-way, pump station sites and power line rights-of-way represent irreversible land use commitments for the life of the project.

The pipeline constitutes an oil-spill hazard for environments traversed and downstream from the pipeline. Based on national pipeline statistics, the probability of a major oil spill during the life of the project is unlikely (less than one occurrence during the life of the project). However, in the event of an accident or natural catastrophe, a pipeline rupture may have irretrievable impacts on soils, vegetation, wildlife, water quality and recreation resources.

The pipeline would commit approximately 237 miles of new steel pipe, ranging in diameter from 30 inches to 48 inches, one 80,000-barrel steel service tank, one 10,000-barrel steel service tank, and miscellaneous steel support equipment. The steel in some of these items is reclaimable upon the termination of the project.

Four 500,000-barrel steel tanks proposed for the Midland terminal would represent an irreversible commitment for the life of the project, but could be converted to other uses or salvaged upon project abandonment. The land used for the terminal would be irreversibly committed for the life of the project.

CHAPTER VIII

ALTERNATIVES TO THE PROPOSED ACTION

All reasonable and realistic alternatives to any proposed action must be considered as part of any Federal analysis or assessment. The basis of assumption for preparation of the alternatives section of this document was that the purpose of the proposed action was to transport domestic crude oil from the southern terminus of the Trans-Alaska Pipeline to existing distribution centers in the Midcontinent of the Lower 48 states.

Curtailment of Prudhoe Bay crude oil production is not likely in view of growing U.S. foreign crude oil imports and the great financial commitment made in the Trans-Alaska Pipeline System. Enactment of the Trans-Alaska Pipeline Authorization Act in 1973 effectively made the national decision for full production of Prudhoe Bay crude oil. Any reduction or curtailment of that production would have severe economic impacts on the State of Alaska by denying anticipated oil royalties and would impact recovery of invested capital. In addition, it would probably create the need for Federal financial allocations to the State of Alaska, as well as to oil companies with deep financial commitments to the development and marketing of Prudhoe Bay crude oil.

The Trans-Alaska Pipeline System Act forecloses any consideration of the sale of Prudhoe Bay crude oil to foreign markets and complicates exchange possibilities. To effect sale to or exchange with a foreign country, the Act requires the President to make and publish express findings that such export would not diminish the total quality or quantity of petroleum available to the U.S. and would be in the national interest. Congress then has 60 days (of which 30 must be "in session") to consider whether such exports are in the national interest. If Congress does not agree with the President's findings, it must pass a concurrent resolution of disapproval within 60 days. The TAPS Authorization Act, however does permit exchanges of oil with adjacent foreign countries (such as Canada or Mexico) or temporary exports, across adjacent foreign states and reentry into the U.S., "for convenience or increased efficiency of transportation," without presidential approval or congressional review.

For convenience of the reader, this section has been divided into the following categories of alternative methods to achieve the purpose of the proposed action: No Action, Including All-Water Routes; Shipment by Rail;

Port of Entry/Pipeline Route Alternatives; and, All-New Pipeline Construction.

NO ACTION, INCLUDING ALL-WATER ROUTES

This alternative considers that Long Beach marine terminal facilities and the Long Beach to Midland pipeline proposed by the applicant would not be constructed. Instead, oil surplus to West Coast needs would have to be transported by tanker from Valdez, Alaska, and off-loaded in the U.S. without the construction of any new land facilities.

Some Alaska North Slope oil could enter West Coast ports via existing facilities. The bulk of the predicted surplus of crude oil in excess of West Coast needs would have to be transported by tanker from Valdez, Alaska, to the Gulf Coast via the Panama Canal, or around Cape Horn.

Transshipment to the Gulf Coast of crude surplus to West Coast needs would significantly reduce the possibility of oil spills along the southern California Coast because tankers would be further out to sea; however, the hazard would not be reduced at whatever off-load port is chosen to receive the crude. The impacts on air quality, marine life, aesthetics, and recreational resources would still exist but could be located in places additional to the West Coast.

Another form of the No-Action alternative would be the sale or exchange of Alaska North Slope oil to a foreign nation, within the confines of the TAPS Authorization Act (PL93153). Assuming the restrictions of that Act are met, sale or exchange would still require tanker operations in the Port of Valdez, Prince William Sound, and Gulf of Alaska areas. Resulting environmental impacts would be similar to those described for the proposed SOHIO project. Impacts identified for the SOHIO proposal in the offload port area and along the proposed pipeline route would generally be shifted to whatever offload port areas would be involved in such sale or exchange routing: e.g., Japan, Canada, Mexico, Panama, or other marketplaces. Where existing foreign facilities are presently adequate to handle such increases in oil import, fewer impacts due to port dredging and filling or pipeline construction would be expected.

Existing product pipelines could be used to move crude on a "when-available" basis. This alternative, however, would not offer an uninterrupted flow of crude oil and could not accommodate the expected volume.

Still another variation of the No Action alternative is a Delayed Action alternative, whereby a larger number of tankers would temporarily bring oil into West Coast ports at a rate that could be absorbed by existing facilities. The existing oil demand/supply situation on the West Coast would have to change substantially to allow maximum utilization of North Slope crude oil. Expansion of on-shore West Coast refineries might be necessary without a west-to-east pipeline for Midcontinent distribution.

Increases in ship movements, off-loading activities, and refinery production would result in more ship accidents, more oil spills and the introduction of additional pollutants to existing ambient air quality resources. This alternative might affect the Los Angeles area to the greatest extent; 57 percent of the West Coast refinery capacity is located there. Most of North Slope production would likely be off-loaded at the Los Angeles/Long Beach Harbor complex.

An all-water alternative would involve more ships, more time on ships, more energy consumption, more loading and off-loading and, hence, more chance of oil spill damage. Economically, the total per-barrel shipping cost of an all-water route would be greater than the cost under the SOHIO proposal. The option of an all-water alternative could increase the cost of Alaskan oil delivery to Midcontinent or eastern consumers.

Cape Horn to the Gulf Coast -- The largest vessels currently being built in U.S. shipyards are in the range of 200,000 to 390,000 DWT. For purposes of assessing this alternative, it was assumed that U.S. flag carriers of 220,000 DWT would be utilized in the marine movement from Valdez around Cape Horn to the Gulf Coast. However, at present, no tanker of this size is listed within the Jones Act fleet.

Since use of larger vessels for this route would result in less loading and unloading than for smaller vessels, the possible oil spill hazards might be reduced. However, the weather and rough water associated with the passage around Cape Horn is substantially more hazardous than the weather conditions which prevail in other waters. To this extent, environmental debits accrue to the marine route around Cape Horn in terms of the risk of a major oil spill.

Should this route be used, it should be noted, no facility currently exists on the Gulf Coast to accommodate tankers in the 220,000 DWT class. During such a voyage, a tanker of this size would consume about 90,000 barrels of bunker fuel, approximately four times the amount of energy which would be consumed in a marine haul from Valdez to the West Coast and subsequent movement of the crude through a pipeline to the Midcontinent.

From an economic standpoint, the U.S. Department of Transportation estimates that the cost of delivering crude to Gulf ports via the Cape Horn route would be $3.01 per barrel, as compared to the estimated $2.14 per barrel if the oil is transported through the Panama Canal under lightering operations and about $1.70 for the Valdez-Long Beach-Midland pipeline route presently proposed by the applicant. In addition, the applicant has notified BLM (October 14, 1976 telephone conversation with SOHIO, Cleveland) that the cost of oil delivered in a 220,000 DWT tanker around Cape Horn to the Gulf Coast would be $4.50 per barrel.

Panama Canal Route -- Shipment of Alaskan crude oil through the Panama Canal has received, and continues to receive, serious attention from owners of the production.

The most critical question about the feasibility of such a route is that of tanker availability in sizes to accomplish both distance and Canal maneuverability. Also of great importance are the treaty negotiations now underway between the United States and Panama. These negotiations will affect the future security of the Canal as a crude transit point for U.S. domestic crude supply.

The physical limitations for vessels transiting the Canal are a maximum length of 960 feet, beam of 106 feet, and drafts of 37 to 39.5 feet. Laden vessels of approximately 60,000 DWT class can be accommodated, depending on the vessel's particular dimensions. In most cases, and chiefly for economic reasons, shipment of Alaskan crude through the Panama Canal would require the use of large tankers from Valdez to the Pacific Coast of Panama, then a lightering to vessels able to transit the Canal's specifications, and movement on to a Gulf Coast or eastern U.S. port in the smaller ships. The Maritime Administration, in a study commissioned by the Federal Energy Administration, has determined that the existing and anticipated Jones Act fleet would be adequate to handle the full West Coast surplus when the Panama Canal route and lightering are used. Lightering would allow large (80,000 to 250,000 DWT) tankers used from Valdez to Panama to be off-loaded at the canal to small (65,000 DWT) tankers able to transit the canal.

The use of smaller vessels for the entire route from Valdez would eliminate the off-loading on the Pacific Coast of Panama from an offshore monobuoy, but would increase the total number of loading and unloading operations and would increase total tanker traffic on the West Coast. In addition, oil spill risks and ship collision risks would be increased.

SHIPMENT BY RAIL

Transportation of North Slope crude oil surplus to West Coast needs from a port in Oregon or Washington to Montana and North Dakota refineries and pipelines could be accomplished by unit trains, according to the Burlington Northern Railroad.

The Oregon port would probably be Port Westward (former Beaver Army Ammunition Depot) on the Columbia River, with one of the largest and most productive estuaries on the West Coast. Containment of a potential oil spill would be hampered by strong river currents and tidal action. The channel can only accommodate 35,000 DWT ships. Extensive dredging would be required for large tankers.

The Washington port would probably be at Anacortes within Puget Sound, an existing port and railhead, which could expose great potential oil spill impacts. In general, smaller tankers have less emission control devices and, therefore, could result in larger adverse air quality impacts.

The cost of moving oil by railroad cars is substantially higher than by pipeline. Although no new main-line track construction would be needed, expansion of existing rail yards at either terminal would be needed to accommodate a special tank car train of 95 cars. Three new 95-car trains are proposed to be constructed, each capable of transporting 52,250 barrels, which would give the railroad the capability of transporting 30,000 b/d from either an Oregon or Washington port to Montana and North Dakota. It would take 50 special tank car trains of 95 cars each to move 500,000 b/d. It is uncertain if enough tank cars could be built in time to move 500,000 b/d eastward.

PORT OF ENTRY/PIPELINE ROUTE ALTERNATIVES

In this section each point of considered entry is on the West Coast and would be linked to an existing midcontinent distribution center via pipeline. In addition to the Port of Long Beach, only the alternative ports of Kitimat, B.C., Canada; Port Angeles, Washington; and, Cherry Point, Washington, are characterized as existing industrial port areas. New berthing facilities, but no dredging, would be required in each of these alternate sites.

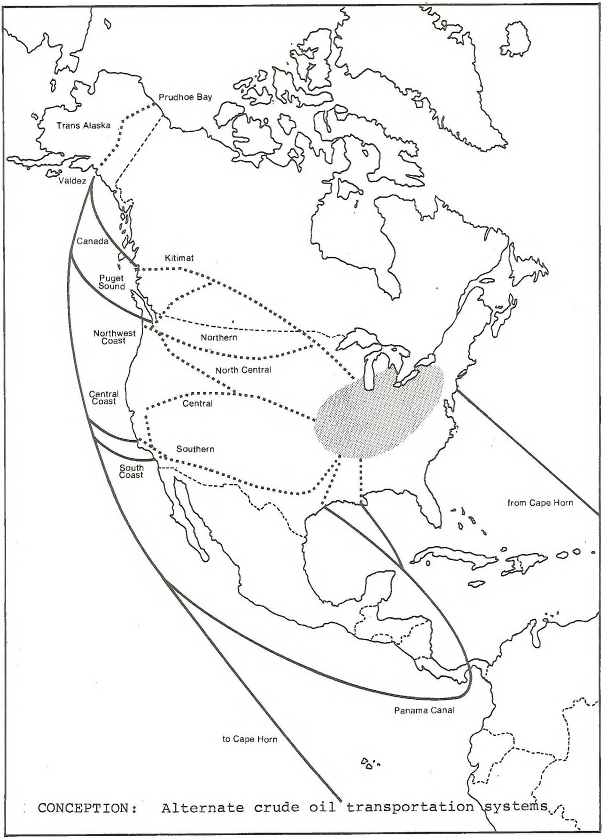
Other alternate off-loading sites are not actual ports, and would have to use off-shore facilities such as monobuoys for off-loading. These sites include Estero Bay, Avila Beach, Oso Flaco, Guadalupe Dunes, Port Hueneme/Oxnard, Deer Creek, and Camp Pendleton, all in California. Use of monobuoys would involve higher risk of oil spills and possibly interrupted service as a result of occasional adverse weather and sea conditions and the less protected berthing situation. It should also be noted that ports and facilities in California would have greater risk of oil spills from earthquakes than other possible sites, and would have greater potential air pollution problems, particularly in the south. (Exhibits J and K, pages VIII-12 and 13)

Kitimat, B.C., Canada to Clearbrook, Minnesota

The Kitimat port would be linked to northern midwest refineries through construction of an all-new 780-mile pipeline between the port and Edmonton, Alberta, Canada, and connection to the Interprovincial Pipeline through Canada, which currently delivers Canadian crude to the Clearbrook, Minnesota, distribution center.

Use of the Kitimat port would require minimal dredging and construction of facilities to accommodate the larger oil tankers. However, the entrance channel to the port presents significant navigational problems and the chance of accident would be greater than in almost all other ports. Major or chronic oil spills would have very severe impact on highly productive and diverse marine and animal populations. An off-loading and storage terminal could be constructed at this site

EXHIBIT J



CONCEPTION: Alternate crude oil transportation systems

SUMMARY OF PORT/PIPELINE ALTERNATIVES

ENTRY POINT	TYPE SITE	DREDGING NEEDED	PIPELINE TERMINUS	PIPELINE MILES NEW	PIPELINE MILES EXISTING	UTILITY CORRIDOR MILEAGE	MAJOR RIVER CROSSINGS	PROTECTED AREAS* MILEAGE
Kitimat, B.C. Canada	New Port	Yes	Edmonton, Alta. Canada	780			13	90
Cherry Point, Washington	Existing Port	No	Edmonton, Alta. Canada		730			
Puget Sound, Washington	Existing Port	No	Clearbrook, Minn.	1700		780	31	160
Puget Sound, Washington	Existing Port	No	Sidney, Nebraska	1400		590	18	80
Central Coast California	Offshore Monobuoy	No	Sidney, Nebraska	1260		290	19	60
Central Coast California	Offshore Monobuoy	No	Midland, Texas	430	800	210	8	31-34
Ventura County California	Offshore Monobuoy	No	Midland, Texas	300	789	150	7	31
Camp Pendleton, California	Offshore Monobuoy	No	Midland, Texas	210	797	120	6	16
Guatemala, Pacific	Offshore Monobuoy	No	Guatemala, Caribbean	277		227	4	
Long Beach California	Existing Port	Yes	Midland, Texas	1026				
(SOHIO PROPOSAL) Long Beach, California	Existing Port	Yes	Midland, Texas	237	789	132	9	16

EXHIBIT K

*New pipeline construction in Parks, National Forests, Game Refuges, Indian Reservations.

with minimal adverse impact on natural, socio-economic, or air quality environment.

The new and existing pipelines for this route would traverse largely mountainous and forested terrain of a primitive nature. However, since existing rights-of-way would be utilized, adverse impact on scenic, vegetative, wildlife, and recreational resources could be reduced.

This alternative would involve Canadian land and authorities. Future use of this port and pipeline for transshipment of Alaskan oil to U.S. markets could involve economic impacts dissimilar from U.S. alternatives because of foreign political and regulative factors.

Cherry Point, Washington to Edmonton, Alta., Canada

This proposal would utilize the existing oil port of Cherry Point, Washington, and reverse the crude oil flow of the Trans-Mountain Pipeline between Cherry Creek, Washington, across Canada to Edmonton, Alberta, Canada. The Trans-Mountain line presently delivers Canadian crude to Puget Sound refiners, but Canada is phasing out its crude exports. Reversing the flow would only require a pump station at Cherry Point and several new pump stations in Canada.

Cherry Point is an existing oil port, and construction of additional berths could accommodate tankers carrying North Slope oil without dredging. However, more ships may be required with this alternative as 125,000 DWT tankers are the maximum allowed by the State of Washington in Puget Sound. This state restriction has been challenged and is under judicial appeal to the U.S. Supreme Court. In general, smaller tankers have fewer emission control devices (such as segregated ballasting and inert gas systems) and, therefore, could result in larger adverse air quality impacts. The risk of accident is also greater for this port because of navigational problems in Puget Sound. An oil spill would have extremely high impacts on the exceptionally rich biotic environment around Cherry Point.

Puget Sound, Wash. Area to Clearbrook, Minnesota

Two alternative ports of entry for the Puget Sound area are under consideration: Cherry Point and Port Angeles.

The Cherry Point port could be linked to Clearbrook, Minnesota, by construction of an all-new 1700-mile pipeline. With little additional construction, the port could accommodate tankers carrying Alaskan oil. A previous Washington state law limiting tankers in Puget Sound to the 125,000 DWT class has been declared invalid by a Federal appeals court; however, the matter is still in litigation and will be considered by the U.S. Supreme Court.

The risk of accident in this port is greater than average because of navigational problems, and a s spill would have extremely high impacts on the exceptionally rich biotic environment.

The pipeline route to Clearbrook could follow existing rights-of-way with impacts similar to other construction alternatives.

Port Angeles is located on the Strait of Juan de Fuca, at the entrance to Puget Sound; hence, the navigational problems and the tanker-size restrictions associated with Cherry Point are not present. The risk of ship accident and oil spill are less. This port has one of the best water depth situations on the West Coast and could accommodate very large tankers. Although minimal dredging and construction would be required, the development of off-loading and storage facilities would adversely impact the non-industrial, socioeconomic, and recreational resources in this area. Air pollutants would impact air quality slightly to moderately under most conditions.

From Port Angeles the 1730-mile route of all-new pipeline construction would travel along the western and southern side of Puget Sound, involving highly sensitive environs. The route would largely follow existing transportation and utility rights-of-way but would traverse a relatively narrow corridor between mountains and the ocean and would potentially involve national forest lands, heavily timbered areas, recreational areas, and several communities.

From Puget Sound the pipeline route would cross the Cascade Range, the Bitterroot Mountains and the Continental Divide (near Helena, Montana), and involves 31 major river crossings including the Columbia, Clark Fork, Missouri (twice between Helena and Great Falls, Montana), and Red rivers. The route traverses the Coeur d'Alene area of Idaho which has very high scenic and recreational values, and traverses a total of 160 miles of national forests, wildlife refuges, and Indian reservations. A segment of the route near Helena, Montana, passes through an area of high potential for earthquake damage and increased risks of line rupture.

Puget Sound, Washington Area to Sidney, Nebraska

Either Port Angeles or Cherry Point could be utilized as the entry port for this alternative (see aforementioned Alternatives for discussion of impacts associated with either port). All-new pipeline construction would extend approximately 1,400 miles from either port to Sidney, Nebraska. The line would follow existing rights-of-way to the extent possible, but a total of almost 600 miles would be removed from existing rights-of-way, including approximately 250 miles through forested environments where a right-of-way would have to be cleared. The pipeline route to Sidney would cross the Cascade Range in Washington, the Blue Mountains in Oregon, skirt the Portney Range in Idaho, and cross the Medicine Bow and Laramie ranges in Wyoming. Nineteen rivers would have to be crossed, including the six anadromous fishery rivers emptying into Puget Sound estuaries as well as the Columbia and Snake rivers, and the Green and North Platte rivers. The route would also traverse the Yakima, Umatilla, and Fort Hill Indian reservations.

Central Coast, California to Sidney, Nebraska

There are four alternative entry sites along the central California coast: Estero Bay, Avila Beach, Oso Flaco, and Guadalupe Dunes. All four alternative sites would have to utilize monobuoys at least two miles offshore. Dredging would be avoided, but a new problem would be created by the danger of chronic oil spills associated with monobuoys, which cannot be properly boomed or cleaned up effectively on the ocean, and hence would be likely to wash ahore. Development of a new port on the central coast, rather than the use of monobuoys, would appear to conflict with California

Coastal Plan policy of confining port development to existing port areas.

The Estero Bay area is adjacent to the Morro Bay estuary, one of the most pristine estuaries in California and one which has been designated for detailed study by the California Department of Fish and Game.

This alternative contains possibly severe impact on commercial and sport fishing, as well as the rich assemblage of marine flora and fauna. Tanker traffic would be increased in an area that already has a moderately high ship traffic volume.

Development of a major marine terminal site would have significant adverse impacts on air quality, marine biotic communities, local social environment, land uses, and recreational resources. Fog and high waves in the winter result in higher navigation and oil spill risk in comparison to other California port areas.

A pipeline connecting this off-loading facility with a midcontinent distribution center would have to travel through the Los Padres National Forest and cross the Salinas River, which is the primary watershed of the central California coastal range.

If the pipeline route from Estero Bay went to Sidney, Nebraska, a new 1500-mile pipeline would have to be constructed going through both the Los Padres and Tahoe National Forests in California, across the Salinas River and the Wasatch Range in Utah where confining topography and present high recreational, vegetative, wildlife and scenic values are present.

The Avila Beach alternative is offshore of a coastal residential community. Degradation of air quality and aesthetics would be a considerable impact. Chronic oil spills from off-loading could impact valuable marine biotic environments including seal rookeries and kelp beds off Point San Luis, as well as Pismo clam beds along six miles of Pismo Beach State Park. Onshore, the impacts of a terminal tank farm would be a disruptive land use in the agricultural and residential area.

The Oso Flaco alternative is offshore of an agricultural and open-space area. Oso Flaco is a series of lakes and valuable wetland habitat. The California Coastal Plan recommends expanding Pismo Beach State Park southward to encompass Oso Flaco and the Santa Maria Dunes. This reach of shoreline is also valuable marine environment that presently supports Pismo clams which would be jeopardized by chronic oil spills from monobuoy off-loading.

Guadalupe Dunes is another open-space area six miles south of Oso Flaco near Point Sal State Beach.

The California Coastal Plan recommends expansion of Point Sal State Beach to encompass the Guadalupe Dunes. This reach of shoreline also supports Pismo clams. The Santa Maria River estuary there is particularly sensitive to impacts from chronic oil spills that would result from monobuoy off-loading.

Construction of a new 1,500-mile pipeline to Sidney, Nebraska, from any of these sites would generally utilize or parallel existing rights-of-way and would not involve impacts dissimilar to any such new pipeline construction. The route would be similar to that described for the Estero Bay alternative.

Central Coast, California, to Midland, Texas

The pipeline route from the central California coast to Midland, Texas, is approximately 1,230 miles long. Connecting the alternative monobuoy sites of Estero Bay, Avila Beach, Oso Flaco, or Guadalupe Dunes to Midland would also involve new pipeline construction extending across the Coastal range and Los Padres National Forest to the Elk Hills National Petroleum Reserve and south across the San Gabriel Mountains through Cajon Pass (San Bernardino National Forest) to tie into the SOHIO proposal at Redlands. From Redlands, California, to Midland, Texas, the route and impacts would be identical to the SOHIO proposal. This route has the advantage of avoiding most of the greater Los Angeles urbanized areas and tying directly into the Elk Hills National Petroleum Reserve, but does cross environmentally sensitive mountainous areas.

Ventura County, California, to Midland, Texas --

Possible Ventura County entry sites include Port Hueneme/Oxnard, or Deer Creek, with either site utilizing offshore monobuoys.

These sites would require construction of an offshore monobuoy system linked to the shore by submerged pipeline and connection by land pipeline to Redlands for tie-in to the proposed SOHIO pipeline route to Midland, Texas.

Degradation of air quality would impact a larger community at Port Hueneme/Oxnard than at Deer Creek. Development at either Port Hueneme/Oxnard or Deer Creek could increase tanker traffic in the Santa Barbara Channel. Chronic oil spills from monobuoy off-loading could have high impacts on coastal resources including Ventura County beaches, Channel Island boating, and the designated marine biologic reserves at Mugu Lagoon. The Deer Creek alternative is a 3-mile reach of shoreline between Point Mugu and Leo Carillo state parks. Kelp beds offshore have been designated as an area of Special Biologic Significance.

The new pipeline would involve 70 more miles of new construction than the SOHIO proposal. Connection with the proposed SOHIO line at Redlands would place the route largely within, or parallel to existing rights-of-way and avoid much construction in the Los Angeles urbanized areas. The route would cross 15 miles of national forest over the Cajon Pass.

Camp Pendleton, California to Midland, Texas

Use of this alternative, again, would require installation of a monobuoy system which could be linked by submerged and onshore pipeline to Midland, Texas.

Although the immediate area is of relatively low biologic importance, oil spills could have high adverse impacts on the nearby Channel Islands, off-shore kelp beds, and San Clemente and other marine life refuges. No navigational problems are present and the chances of tanker accident are relatively low; however, the use of this site would aggravate growing air pollution problems in the area.

The pipeline route would involve less than 100 miles of new construction between the coast and Beaumont, California, where the existing Southern California natural gas pipeline could be converted to crude transport and the remaining route to Midland could follow the same route as proposed for the SOHIO transportation project.

New construction would follow existing rights-of-way except over the 10-mile portion to the Las Pulgas Canyon area, which is noted for its wildlife habitat values.

Trans-Guatemala Pipeline

A proposal has been made for a new 227-mile 42-inch pipeline across Guatemala from Buena Vista on the Pacific Ocean to a port at San Francisco del Mar in the Golfo de Omoa on the Caribbean.

Offshore berths on the Pacific Ocean would be required at Buena Vista to get sufficient depth without dredging. Tankers of the 200,000 DWT class would deliver Alaskan oil to Buena Vista while 50,000 to 80,000 DWT tankers would transport the oil from San Francisco del Mar to the United States.

The project would offer a major socio-economic stimulus to Guatemala from construction and operation of the ports and pipelines. The environmental impact of construction of the pipeline in jungle and mountain environments may be very disruptive to relatively pristine ecosystems.

This alternative would involve Guatemalan lands and authorities. Future use of ports and pipeline for transshipment of Alaskan oil to U.S. markets could involve economic impacts dissimilar from a U.S. route alternative because of foreign political and regulative factors.

ALL NEW PIPELINE CONSTRUCTION

Should it be decided that abandonment of the Southern California natural gas pipeline in California and the El Paso natural gas pipeline in Texas, New Mexico and Arizona not be permitted for conversion to crude oil use, then one alternative would be construction of an all-new pipeline in the Southwestern United States: for example, from a Southern California coastal off-load site to Midland, Texas. Existing rights-of-way could be expected to be utilized or closely paralleled for much of the distance. Use of this alternative might require detours around existing urbanized areas where encroaching development constrains acquisition of new rights-of-way.

It would be expected that a pipeline larger than 30 inches in diameter would be used for an all-new pipeline construction alternative. A 42-inch diameter pipe could move 500,000 barrels per day at minimum levels of pump stations, and could move 1,000,000 barrels per day if the pump installation were maximum. Such construction could correspond to the proposed SOHIO project.

Modifying the project to use all-new pipeline rather than conversion of the existing gas pipelines would affect previously discussed impacts in two basic ways: (1) the long corridor of old construction scar now existing above the present gas pipeline location would once again be disrupted by equipment access and construction, with corresponding loss of whatever natural regrowth has occurred on the site; (2) no reduction in gas pipeline capacity serving California would result from the project. However, present supplies of natural gas from the Permian Basin of Texas are already rapidly depleting. In addition, an all-new pipeline would be able to accommodate and move Elk Hills crude oil production if needed.

CHAPTER IX

CONSULTATION AND COORDINATION

Preparation of the Environmental Statement was performed by a Federal analysis team with professional expertise in the fields of petroleum/civil engineering, wildlife and marine biology, range conservation, landscape arthitecture, economics, land use planning, geology, air quality, botany, and archaeology. Independent consulting firms were retained to analyze the following components: air quality, socioeconomics, energy supply and demand, fresh water quality, noise, geotechnics, and engineering evaluation of the existing natural gas pipeline proposed for conversion.

The analysis team traveled the pipeline corridor for familiarization, maintaining liaison along the route with Federal, state, and local agencies, as well as industries, organizations, universities, and individuals concerning specific areas of expertise. Contacts with archaeology and historic preservation offices in the various affected states were made. The Advisory Council on Historic Preservation was not contacted during preparation of the DES, but was given opportunity to comment, and did comment, on the published DES.

During preparation of the DES, consultations were held at a working level with Federal agencies having special expertise relating to the proposed action. Working relations were also established with various agencies in the separate states to gain information and advice.

A Federal/state task force on the SOHIO proposal was formed in March 1975, including all state and Federal agencies within California having responsibility, advisory or jurisdictional authority for the State of California Environmental Impact Report on the proposal and/or the Federal ES. This task force met several times during the preparation period in addition to frequent consultations between the team and state authorities. Consultation and coordination were also effected with city and county agencies along the entire route of the proposed action.

Thirteen informal public informational briefings were conducted in California, Arizona, New Mexico, Texas and Washington by BLM and the Corps of Engineers personnel concurrent with the DES preparation. Formal statements from governmental agencies in Arizona, New Mexico, and Texas were strongly supportive of the proposed project. At the Sacramento, California, meeting most state governmental agencies were represented but no formal statements were made and no questions asked. Consistent among the questions from all audiences were the following concerns:

1. Amounts of energy required for the pumping stations.
2. Water requirements for the terminals at Long Beach and Midland, and for the pumping stations.
3. Possible adverse environmental impacts on wildlife, aesthetics, and game refuges.
4. Oil spill potential in event of pipeline rupture.
5. Impact of abandonment of natural gas pipeline on supply of natural gas to California.
6. Possibility of additional refineries in states to be crossed by pipeline.
7. Possibility of tie-ins to pipeline in Arizona and New Mexico for crude oil supply.
8. Number and types of alternatives being considered.
9. Employment potential in states and cities traversed by the proposed project.

Copies of the working draft of the first three chapters (Description of the Proposal, the Environment, and Environmental Impacts of the Proposed Action), along with a preliminary list of mitigating measures and consultation and coordination contacts, were sent to appropriate and/or involved governmental and private groups in September, 1976.

Informal comments received as a result of this preliminary distribution were incorporated, wherever possible, in the DES. Copies of these comments are on file in the BLM State Office at Sacramento, California.

A supplemental mailing was made September 10, 1976, of the preliminary draft of mitigating measures including those proposed and applicant-committed and those required by Federal law, to Federal, state and local agencies with permitting authority related to the proposed project. Each agency was asked: (a) to identify measures the agency has legal authority to implement; (b) would the agency implement such measures; (c) does the agency have personnel available to implement such measures; and, (d) any additional mitigating measures over which the agency has authority.

On April 15, 1977, most of these governmental units were given another opportunity to review the proposed and committed mitigating measures. Responses made it possible to change the listing of many measures from "proposed" to "committed" in Chapter 4 of the FES.

The Draft Environmental Statement was distributed to the appropriate, concerned governmental and private groups in the affected states. It was available for inspection at the BLM Office of Public Affairs in the Interior Building, Washington, D.C.; as well as at the BLM Public Affairs Offices at Sacramento, California; Phoenix, Arizona; and Santa Fe, New Mexico; the Library, Room 6650, of the U.S. Army Corps of Engineers, Los Angeles District; Office of Public Information, Federal Power Commission, Washington, D.C.; Public Information Office, Port of Long Beach; BLM Public Affairs Office, Building 55, Los Alamitos Naval Air Station, Los Alamitos, California.

Of the 1,000 copies of the DES that were printed, 980 were distributed, principally by mail. Three thousand copies of the Executive Summary were printed, one included with each DES, and an additional 1,800 distributed separately.

A Notice of Availability of the Draft Environmental Statement and the schedule of public hearings appeared in the Federal Register of November 24, 1976. The review period began on the date the notice appeared.

Public hearings were held in Long Beach, Los Angeles, and Blythe, California; Midland and El Paso, Texas; Phoenix, Arizona; Albuquerque, New Mexico; and Seattle, Washington, during the period January 4 - 7, 1977, for the express purpose of receiving views, comments, and suggestions from the public. At the conclusion of each witness's testimony, members of the hearing panel asked questions in the interest of clarification.

A total of 350 people attended the eight public hearings; 57 speakers offered oral statements which were transcribed by outside reporting services. Transcripts totaled 382 pages, including the written comments. Copies of the complete transcripts for each hearing are available for public inspection at the Bureau of Land Management, California State Office, Sacramento, California.

Major concerns expressed at the public hearings included:

1. Concern about oil spills in the terminal area and pipeline spills or leaks that would pollute ground water and/or endanger wildlife, particularly if oil entered the water at stream crossings.

2. The effect of the pipeline and ancillary construction on wildlife habitat, especially in the Kofa Game Range area of Arizona.

3. Damage to aesthetic values by transmission lines.

4. Opposition to a terminal in Central California coastal areas.

5. Apprehension about increased ship traffic inside the Santa Barbara Channel or outside the Channel Islands.

A total of 127 letters and written comments were received during the 60-day review period for the Draft Environmental Statement. Comments were received from 27 Federal, 19 state, and 9 local governmental agencies, 26 private organizations and groups and 39 individuals. Comments in 65 of the letters or written testimony listed substantial questions concerning the adequacy of the Draft Statement.

Questions and comments were received on virtually all sections of the DES. The subjects most frequently discussed were: air quality impacts in the Los Angeles Air Shed, at Midland, and at Valdez; the supply of natural gas to California; the risk of tanker accident and oil spill in Prince William Sound and south at Central California Coastal areas; impacts of pump stations and powerlines; alternatives, especially those involving no pipeline construction from the West Coast; and earthquake hazards.

Many letters and written testimony were received from agencies, organizations, and individuals in the Los Angeles - Long Beach area and in Texas, expressing general support for the project due largely to economic reasons. Several letters from the Long Beach area expressed disapproval of the project because of environmental reasons. Many letters were received from Central California residents expressing opposition to any alternative offloading port locations along the Central California coast. Arizona residents indicated both support and opposition to the proposed pipeline.

Approximately 450 pages of specific comments were received from the applicant (SOHIO) and the applicant's consultant (Williams Brothers Engineering Company). Many of the suggested changes, based on refinements of the project, engineering design or more recent or relevant data, were incorporated into the FES analysis. Several points listed by the applicant are not reflected in the FES because of independent study and findings by BLM. Most notable of these is the discussion of impacts in the FES based on the use of 14 tankers for the system rather than the 11 proposed by the applicant.

Chapter 9, "Consultation and Coordination," of the full Environmental Statement contains reprints of all letters and written comments received at public hearings or through other means. Each separate comment is annotated and response to each comment, prepared by the BLM analysis team, appears in this chapter.

SUMMARY OF GLOSSARY TERMS

This is a summary of technical terms used within this document. A complete glossary can be found in the Appendix volume of the Full Environmental Statement.

API -- American Petroleum Institute

ARB -- California Air Resources Board

BALLASTING -- the process of taking on ballast, such as seawater, in an oil tanker, to immerse the hull, propeller, and rudder in the interest of controllability and to improve stability of the ship. Depending on the type of ship, ballast is put into cargo tanks or separate compartments which results in the displacement of vapors, including hydrocarbons, into the atmosphere.

BREATHING -- Allowing a tank to remain open to the outside atmosphere while any liquid in the tank remains in a static state, thus allowing constant equalization of pressure/vacuum between tank and external atmospheres.

DWT -- deadweight tonnage. The total weight capacity of a ship expressed in long tons (2,240 lbs). Displacement of a fully loaded ship, less the weight of the ship itself.

FLOATING ROOF -- a roof that rests on the surfae of the oil contained in a tank rather than on a structural member. The roof raises and lowers with the level of liquid within the tank.

GAS FREEING -- the deliberate replacement of the atmosphere within an empty tank by fresh air. A process conducted at infrequent periods when necessary to enter an oil cargo tank for inspection or repairs. Before personnel are permitted to enter a tank, the tank must be certified gas-free by a marine chemist. The process of changing the atmosphere leads to the emission of hydrocarbons and other gases from the tank.

HOTELING -- a ship at anchor or at berth, and consuming fuel only for electrical power generation.

HYDROCARBONS -- compounds composed principally of carbon and hydrogen; they occur in petroleum, natural gas, coal, and bitumens.

HYDROSTATIC TESTING -- filling a pipeline or tank with water under pressure to test for tensile strength; its ability to hold pressure without rupturing.

INERT GAS SYSTEM OR INERTING -- the introduction of inert gas into a tank containing liquid to replace the void created by discharge of the liquid. The process of reducing the oxygen level in an oil tanker's cargo compartments to prevent corrosion and explosion. Filling the vapor space of cargo compartment with inert gas; the gas used is usually flue gas from the ship's boilers and washed clean of sulfur and other corrosive substances. (NOTE: This term is not in general use in practice.)

LIGHTERING -- off-loading or loading ships (e.g., crude oil) not lying at wharves, using boats or barges.

NITRIC OXIDE -- a molecule of one nitrogen and one oxygen atom -- NO. Results usually from combustion of organic substances containing nitrogen and from recombination of nitrogen decomposed in air during high temperature combustion.

NO -- nitric oxide.

NOx -- oxides of nitrogen, a mixture of NO and NO2.

NO2 -- nitrogen dioxide.

OXIDES OF NITROGEN -- a gaseous mixture of nitric oxide (NO) and nitrogen dioxide (NO2) and symbolically represented as NOx. Can include particulate species such as nitrate compounds (-NO3).

PIG (SCRAPER) -- a cylindrical device (3 to 7 feet long) inserted in a pipeline for the purpose of sweeping the line clean of water, rust, or other foreign matter. When inserted in the line at a "scraper trap," the pressure of the oil stream behind it pushes the pig along the line. Pigs or scrapers are made with tough, pliable discs that fit the internal diameter of the pipe, thus forming a tight seal as they move along cleaning the pipe walls.

PRODUCTS PIPELINE -- a pipeline carrying refined petroleum products such as gasoline or jet fuel.

PURGING -- the operation of displacing the hydrocarbon gas mixture from an oil cargo tank to reduce the gas concentration to below the explosive mixture level. The hydrocarbon gas mixture is displaced by blowing air or inert gas into the tank. The displaced gas is released to the atmosphere.

RIGHT-OF-WAY (ROW) -- (1) a legal right of passage over another person's land; (2) a strip of land for which permission has been granted to build a pipeline and for normal maintenance thereafter.

SCAPCD -- Southern California Air Pollution Control District. (See South Coast Air Quality Management District.)

SEGREGATED BALLAST -- ballast which is contained in ship compartments designed only for that use, as opposed to pumping ballast (seawater) into empty cargo tanks.

SEGREGATED BALLAST, FULLY -- segregation of ballast is complete when tankage dedicated solely to ballasting can carry an amount of water equal, by weight, to approximately 35 percent of the ship's deadweight tonnage.

SEGREGATED BALLAST, 20% -- dedicated ballast tankage can hold an amount of water equal, by weight, to 20 percent of the ship's deadweight tonnage.

SO2 -- sulfur dioxide.

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT (SCAQMD) -- the district charged since February, 1977, with maintaining air quality in the Los Angeles Air Shed. Created by the California Legislature with passage of Assembly Bill 250 (1976). Supersedes the Southern California Air Pollution Control District. The Los Angeles Air Pollution Control District was previously absorbed into the latter district.

STATE IMPLEMENTATION PLAN -- a plan prepared by each state and subject to approval by the U.S. Environmental Protection Agency. The purpose of the plan is to achieve and maintain the National Ambient Air Quality Standards (NAAQS) through controls on emissions.

SULFUR DIOXIDE -- a molecule of one sulfur and two oxygen atoms -- $SO2$. Results usually from combustion of organic substances containing sulfur.

SWEET CRUDE -- definition is dependent upon individual refinery capabilities. For purposes of this report, sweet crude will mean the sulfur content is 1 percent or less.

TANK CLEANING -- oil cargo tanks are cleaned by a machine playing powerful jets of water or crude oil on interior surfaces in order to remove deposits, prepare for a change of cargo, or take on clean ballast. The accumulated oil and water is gathered and separated. Oil residue is discharged onshore or added on top of the next cargo load.

TANK DIKE -- a wall of earth or concrete surrounding an oil tank to contain the oil in the event of the tank running over or rupturing.

THROUGHPUT -- the volume of feedstock (e.g., crude oil) processed or transported in a specified time.

VTS (VTCS) -- Vessel Traffic (Control) System. A radar and radio communication system used to space large ships in and near harbors.

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(June 1984)

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